MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JANUARY, 1873.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE, STATISTICAL DIVISION,
Washington, D. C., January 27, 1873.

SIR: I herewith present for publication the results of the annual investigation concerning the prices of farm animals and their numbers, in comparison with the statement of the previous year; also, a translation of recent foreign communications from consular and other sources; a record of agricultural imports of the past fiscal year, and results of investigation in the different divisions of the Department.

Respectfully,

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

COMPARATIVE NUMBERS AND PRICES OF FARM STOCK.

Returns of our annual circular relating to comparative numbers and prices of domestic animals show an increase in horses, cattle, and sheep, while the numbers of swine will aggregate nearly, if not quite, the total of last year. The advance is not heavy, but is most apparent in sheep, amounting to about one million, or near three per cent., exclusive of the Territories. The indicated increase in horses is about two per cent., and nearly the same advance in cattle. A slight increase in mules is also apparent.

The percentage of horses, as compared with last year, is as follows: Maine, Rhode Island, Connecticut, and New Jersey, 99 per cent.; New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Delaware, Florida, Ohio, 100; Maryland, Virginia, North Carolina, South Carolina, Alabama, Tennessee, Indiana, California, 101; Georgia, Kentucky, Illinois, Wisconsin, 102; Iowa, Missouri, Oregon, 103; Louisiana, West Virginia, 104; Mississippi, Texas, 105; Minnesota, 108; Arkansas, 109; Kansas, Nebraska, 110.

Mules in New York, New Jersey, Pennsylvania, Delaware, Virginia, Florida, Louisiana, California, 100; Maryland, Kentucky, Ohio, Michigan, Indiana, Wisconsin, 101; Georgia, Alabama, Mississippi, Tennessee, Illinois, Iowa, 102; South Carolina, Nebraska, 103; North Carolina, West Virginia, 104; Texas, Minnesota, 106; Kansas, 107; Arkansas, 108.

The States in which a decrease in cows appears are Texas, 94; Florida, 97; North Carolina, Alabama, Mississippi, 98; Massachusetts, Rhode Island, Connecticut, Georgia, 99. Those in which numbers are unchanged are Delaware, Maryland, Virginia, South Carolina, and Kentucky. The following States show an increase, New York, Pennsylva-

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nia, Michigan, 101; New Hampshire, Vermont, Tennessee, West Virginia, Ohio, Indiana, Illinois, 102; Missouri, Louisiana, 103; Maine, Wisconsin, Iowa, California, Oregon, 105; Minnesota, 108.

The comparison of numbers of oxen and other cattle in the several States is as follows: Texas, 91; Connecticut, California, 95; Kentucky, 96; Florida, 97; Rhode Island, New Jersey, Pennsylvania, Maryland, Mississippi, 99; Vermont, Delaware, Virginia, South Carolina, Georgia, 100; New Hampshire, Massachusetts, New York, Tennessee, West Virginia, Michigan, 101; Alabama, Louisiana, Ohio, Indiana, Illinois, Missouri, 102; North Carolina, 103; Wisconsin, Iowa, 105; Arkansas, Minnesota, Oregon, 107; Maine, 108; Nebraska, 112; Kansas, 115.

In the following States a decrease in the numbers of sheep appears: Louisiana, Tennessee, Kentucky, 95; Mississippi, 96; Iowa, 97; Georgia, Indiana, 98; North Carolina, Alabama, Missouri, 99. No change is reported in Rhode Island, Virginia, or Texas. Increase is apparent in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, South Carolina, Florida, Arkansas, West Virginia, Ohio, Michigan, Illinois, Wisconsin, Minnesota, Kansas, Nebraska, California, and Oregon.

The comparative numbers of hogs are as follows: Vermont, 95; New Jersey, 96; New Hampshire, North Carolina, Mississippi, Texas, California, 97; Rhode Island, Connecticut, South Carolina, Florida, Alabama, 98; New York, Pennsylvania, 99; Maine, Massachusetts, Kentucky, 100; Virginia, Louisiana, Tennessee, Wisconsin, 101; Georgia, Ohio, Michigan, 102; Delaware, Maryland, Arkansas, Illinois, Minnesota, Oregon, 103; Missouri, 105; West Virginia, 106; Indiana, 109; Nebraska, 118; Kansas, 120.

PRICES.—The prices of farm stock are better sustained than the rates obtained for other products of the farm. Horses command improved prices in nearly all sections of the country. Sheep are somewhat higher than last year, the appreciation being quite general, though not equal in the different sections. Cattle have advanced in some States, from local causes, and receded in others, milch cows generally advancing in the South and declining slightly in the North, while other cattle have advanced in some sections, particularly in the States north of the Ohio River. Swine are held at higher rates in the Eastern States, though prices elsewhere have generally declined.

An increase is shown in the prices of horses of all grades in New England, in New York, and Pennsylvania, in the cotton States, and in those of the Pacific coast. The comparison in New York is as follows:

	1 year.	2 years.	3 years.	Over 3 years.
1872, February	$40 49	$67 41	$94 58	$130 58
1873, January	42 00	69 50	99 00	135 00

In New Jersey prices have uniformly been quoted higher than in any other State, and while they are still relatively high, the rates of last year are not fully sustained. A small decline also appears in Delaware and Maryland. A slight advance appears in Virginia, and in horses of full age in North Carolina. The rate for horses of three years and upward in Georgia has advanced from $113.29 to $123; in Mississippi, from $110 to $111.21; and in Texas the comparison is as follows:

	1 year.	2 years.	3 years.	Over 3 years.
1872, February	$12 43	$18 72	$30 08	$46 23
1873, January	15 32	22 48	32 92	51 29

A slight advance is seen in Arkansas, and a decline in Tennessee from $105.27 to $101.20, from $93.15 to $88.25 in West Virginia, and from $89.67 to $87.66 in Kentucky. The change is slight in Ohio, Indiana, and Illinois; former high rates in Michigan are not fully sustained. Young stock in Minnesota shows little change, while prices of full-grown animals have advanced. An increase is also made in Wisconsin. A slight tendency to retrograde is seen in Iowa:

	1 year.	2 years.	3 years.	Over 3 years.
1872, February	$27 27	$41 35	$59 47	$85 02
1873, January	27 91	42 50	61 73	88 00

The highest class in Missouri has declined from $74.15 to $72.35; in Kansas from $84.26 to $76.59. In Nebraska the prices of young horses sympathize with the prevalent low rates for farm products, but full-grown horses, in great demand for service in enlarging the cultivated area, bring higher prices than last year. Horses are also higher in California and Oregon.

Horses bear the highest average price in New Jersey, for the several classes respectively, $48.12, $79.50, $112, $147.50, in Texas the lowest, the range of the classes being from $15.32 to $51.29. New York stands next below New Jersey; and California, Missouri, Oregon, Iowa, and Illinois come in order above Texas.

The prices of working-mules have advanced throughout the Middle and Southern States, except that the high rates in New Jersey are not sustained, though the average is still higher than in any other State. The average in Texas has advanced from $67.60 to $75.73. Growing-mules in Kentucky are held at an advance, while the rate for full-grown is unchanged, at $112.15. A slight advance is seen in Indiana, Illinois, and Minnesota, and a small decline in Wisconsin, Iowa, Missouri, and Kansas. The stock of Nebraska is inadequate to the wants of agriculture, and commands advanced rates.

With a few exceptions, the prices of milch-cows are placed below the rates of last year. In Maine, New Hampshire, and Vermont, particularly in the first named State, where cattle were sacrificed last season on account of the partial failure of the hay-crop, prices have rallied with the increase of forage. There has been an upward tendency in this kind of stock in all the cotton States, which keeps pace with the movements toward improvement in quality and enlargement of the dairy interest. A few examples will show the rate of decline in other States:

	New York.	Ohio.	Michigan.	Illinois.	Iowa.	Kansas.
1872	$39 53	$37 36	$36 86	$33 77	$28 49	$30 77
1873	34 00	32 18	33 32	30 73	28 16	28 94

"Oxen and other cattle" are held at much higher rates in Maine, for the reason affecting the prices of milch cows; and an advance appears also in New Hampshire, Vermont, Massachusetts, and Rhode Island. No material change of rates is apparent in New York. In New Jersey prices have declined, and also slightly in Pennsylvania. In Delaware, Maryland, Georgia, Alabama, and Florida some advance is noted, while in Virginia and South Carolina rates are substantially unchanged, and in North Carolina not fully sustained. The Texas rates are slightly declining as follows:

	1 year.	2 years.	3 years.	Over 3 years
1872, February	$3 10	$4 86	$8 07	$12 52
1873, January	3 00	4 42	7 56	11 5

So in Arkansas; while in Louisiana and Tennessee there is no material change. The price of cattle three years old and upward has declined in Kentucky from $39.41 to $37.54; in Ohio, from $45.16 to $42.43; in Michigan, from $46.18 to $46; in Wisconsin, from $42.38 to $37.08; in Minnesota, from $38.46 to $36.77. An advance appears in Indiana from $36.53 to $39.06; in Illinois, from $36.40 to $38.83; in Iowa, from $36.16 to $38.83; in Missouri, from $29.72 to $30.15. The younger cattle command a proportionate increase in these States. A comparison of prices (of three years old and upward) in these States is as follows:

	Kentucky.	Ohio.	Michigan.	Indiana.	Illinois.	Iowa.	Kansas.
1872....	$39 71	$45 16	$46 18	$36 53	$36 40	$36 16	$31 42
1873....	37 54	42 43	46 00	39 06	38 66	38 83	31 13

Taking all the States together, the prices of cattle of all grades are well sustained amid the despondency arising from the low rates of many other productions of the farm.

A continued advance in the price of sheep is reported, almost without exception, although it is small in some of the States. The lowest average is $1.75, in North Carolina and Georgia, and the highest is $5.75, in Rhode Island. The comparison (for sheep one year old) in the following States is thus stated:

	Kentucky.	Ohio.	Michigan.	Indiana.	Illinois.	Iowa.	Missouri.	Kansas.
1872..	$2 84	$2 37	$3 14	$2 76	$2 90	$2 88	$2 14	$2 56
1873..	3 13	3 32	3 17	3 06	3 60	2 70	2 22	2 72

The prices of stock-hogs are somewhat higher in New England. In New York a small advance is reported, and in several of the Southern States. In the principal pork-producing States the necessity of a larger stock of swine to make use of the abundance of cheap corn, which does not bear transportation, has kept the price proportionately higher than that obtained for pork products.

The following comparison is given:

State.	1872.		1873.	
	Under one year.	Upward of one year.	Under one year.	Upward of one year.
Ohio	$3 93	$9 07	$3 37	$8 17
Michigan	3 54	8 06	3 40	7 88
Indiana	2 98	6 75	2 76	6 16
Illinois	3 78	7 48	3 40	7 01
Iowa	3 71	7 94	3 42	7 54
Missouri	2 18	4 78	1 82	4 17

The highest average is $19.91 for old hogs, in Connecticut; the lowest, $4.17, in Missouri.

States.	HORSES.					MULES.					MILCH COWS.	
	Total number of horses compared with that of January, 1872.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price per head over 3 years old.	Total number of mules compared with that of January, 1872.	Average price per head under 1 year old.	Average price per head between 1 and 2 years old.	Average price per head between 2 and 3 years old.	Average price per head over 3 years old.	Total number of milch cows compared with that of January, 1872.	Average price per head at this time.
Maine	99	$27 50	$48 66	$74 58	$106 50	.....	.....	.....	.....	.....	105	$36 56
New Hampshire	100	29 00	50 55	76 66	108 00	.....	.....	.....	.....	.....	102	36 00
Vermont	100	34 40	55 00	82 00	115 00	.....	.....	.....	.....	.....	102	35 33
Massachusetts	100	33 20	55 00	84 40	130 00	.....	.....	.....	.....	.....	99	41 16
Rhode Island	99	35 00	60 00	86 50	122 50	.....	.....	.....	.....	.....	99	42 50
Connecticut	99	35 00	58 00	83 00	121 66	.....	.....	.....	.....	.....	99	39 50
New York	100	42 00	69 50	99 00	135 00	100	$41 50	$71 00	$107 50	$149 00	101	34 00
New Jersey	99	48 12	79 50	112 00	147 50	100	43 50	74 25	109 37	160 00	100	44 16
Pennsylvania	100	41 30	69 50	102 00	134 00	100	48 00	76 00	116 00	148 00	101	35 50
Delaware	100	42 50	60 00	80 00	120 00	100	40 00	65 00	85 00	122 50	100	33 00
Maryland	101	40 00	66 00	88 50	113 00	101	49 00	70 00	112 00	137 00	100	30 77
Virginia	101	34 00	52 48	78 40	108 23	100	42 22	63 88	98 03	126 21	100	23 69
North Carolina	101	38 00	60 50	84 50	112 00	104	44 13	70 13	103 12	128 00	98	17 00
South Carolina	101	38 50	61 00	90 00	120 00	103	37 12	60 00	105 00	130 00	100	25 50
Georgia	102	40 90	64 50	90 75	123 00	102	46 50	72 00	110 00	135 00	99	21 93
Florida	100	45 00	65 00	91 00	125 00	100	55 00	85 00	112 50	136 00	97	15 11
Alabama	101	36 78	56 00	90 93	123 23	102	40 38	65 35	103 00	127 37	98	19 85
Mississippi	105	33 50	52 08	75 50	111 21	102	39 81	64 25	97 35	126 21	98	23 12
Louisiana	104	25 25	43 25	67 00	108 75	100	38 33	60 00	90 00	130 00	103	26 50
Texas	105	15 32	22 48	32 92	51 29	106	24 00	37 50	53 48	75 73	94	13 50
Arkansas	109	31 92	44 65	63 07	89 00	108	38 84	56 53	81 66	110 00	107	20 43
Tennessee	101	38 29	57 52	79 94	101 20	102	43 37	66 80	95 00	117 62	102	21 54
West Virginia	104	28 30	44 42	64 03	88 25	104	35 00	56 55	83 50	110 50	102	29 80
Kentucky	102	33 00	48 59	62 80	87 66	101	41 24	61 34	89 81	112 15	100	30 13
Ohio	100	34 39	53 89	77 00	104 45	101	37 78	60 37	89 78	112 00	102	32 18
Michigan	100	32 00	53 86	79 54	105 70	101	36 58	62 08	87 50	120 75	101	33 32
Indiana	101	30 32	46 52	64 43	88 50	101	36 38	56 02	79 37	108 81	102	30 73
Illinois	102	28 50	42 06	61 64	88 56	102	33 65	51 77	75 00	105 29	102	30 45
Wisconsin	102	31 00	49 00	70 20	105 29	101	42 91	61 25	83 75	120 00	105	28 00
Minnesota	108	33 50	53 77	79 60	113 63	106	35 00	54 58	80 83	120 69	108	30 08
Iowa	103	27 27	41 35	59 47	85 02	102	33 62	50 93	74 95	102 62	105	28 16
Missouri	103	24 72	36 62	51 45	72 35	102	32 74	48 95	68 72	92 58	103	23 26
Kansas	110	23 31	36 00	53 05	76 59	107	30 99	47 29	68 66	96 75	112	28 94
Nebraska	110	29 16	45 33	67 91	98 84	103	38 66	56 66	85 00	118 50	110	30 96
California	101	19 14	28 58	40 82	66 17	100	24 00	37 50	61 25	92 13	105	43 44
Oregon	103	23 86	35 00	49 54	72 66	95	20 50	30 70	44 10	63 75	105	32 95

States.	OXEN AND OTHER CATTLE.					SHEEP.			HOGS.		
	Total number of oxen and other cattle compared with that of January, 1872.	Average price per head under one year old.	Average price per head between one and two yrs old.	Average price per head between two and three years old.	Average price per head over three years old.	Total number of sheep compared with that of January, 1872.	Average price per head under one year old.	Average price per head over one year old.	Total number of hogs compared with that of January, 1872.	Average price per head under one year old.	Average price per head over one year old.
Maine	108	$13 66	$22 11	$33 45	$83 00	106	$3 62	$4 52	100	$8 00	$15 60
New Hampshire	101	10 83	21 00	35 00	63 83	105	3 60	4 45	97	9 50	18 50
Vermont	100	11 83	21 50	35 50	63 33	104	3 25	4 30	95	7 50	15 75
Massachusetts	101	12 00	22 00	36 00	65 00	112	3 12	4 12	100	11 50	19 40
Rhode Island	99	12 20	22 25	36 50	66 00	100	4 20	5 75	98	10 00	18 00
Connecticut	95	12 66	20 00	35 00	55 50	105	3 58	5 39	98	10 88	19 91
New York	101	11 20	20 00	32 00	52 00	102	3 40	4 60	99	6 65	13 30
New Jersey	99	12 50	20 62	31 75	47 33	103	4 25	5 20	96	7 50	14 50
Pennsylvania	99	10 62	18 45	30 64	46 50	101	2 75	4 00	99	6 50	13 00
Delaware	100	11 00	16 00	29 00	45 00	108	3 00	4 50	103	5 00	8 00
Maryland	99	10 50	16 22	22 88	35 00	102	3 50	4 40	103	5 03	10 12
Virginia	100	6 60	11 50	18 75	27 60	100	2 46	3 24	101	2 90	6 00
North Carolina	103	3 77	6 71	10 65	16 26	99	1 22	1 75	97	2 32	5 36
South Carolina	100	6 06	9 43	14 50	23 00	101	1 47	2 25	98	3 80	7 25
Georgia	100	4 69	7 83	12 09	17 55	98	1 24	1 75	102	2 34	4 99
Florida	97	4 00	5 94	9 88	14 40	113	1 37	2 25	98	2 05	4 65
Alabama	102	6 43	10 20	13 02	20 41	99	1 26	2 16	98	2 32	5 47
Mississippi	99	4 35	7 85	11 81	20 17	96	1 26	2 05	97	2 14	5 50
Louisiana	102	5 31	8 72	12 69	18 00	95	1 28	2 25	101	2 65	7 77
Texas	91	3 00	4 42	7 56	11 54	100	1 15	2 02	97	2 16	5 14
Arkansas	107	3 83	7 26	11 40	18 59	109	1 56	2 41	103	1 89	4 67
Tennessee	101	4 80	8 77	13 75	21 00	95	1 46	2 09	101	2 59	5 75
West Virginia	101	8 83	16 06	25 50	37 30	104	1 94	2 92	106	2 80	5 95
Kentucky	96	7 75	14 65	24 37	37 54	95	2 17	3 13	100	2 30	5 89
Ohio	102	9 66	17 52	28 47	42 43	102	2 15	3 32	102	3 37	8 17
Michigan	101	8 20	16 00	27 10	46 00	108	2 07	3 17	102	3 40	7 88
Indiana	102	9 30	16 47	26 97	39 06	98	2 16	3 06	109	2 76	6 16
Illinois	102	9 35	16 64	26 89	38 66	102	2 00	3 60	103	3 40	7 01
Wisconsin	105	7 89	14 25	23 46	37 08	105	2 17	3 06	101	3 58	7 96
Minnesota	107	7 61	13 79	23 09	36 77	104	2 15	3 39	103	4 00	8 15
Iowa	105	9 12	15 77	25 46	38 83	97	1 60	2 70	107	3 42	7 64
Missouri	102	6 85	12 69	20 24	30 15	99	1 57	2 22	105	1 82	4 17
Kansas	115	7 22	13 35	20 94	31 13	106	1 67	2 72	120	4 12	8 85
Nebraska	112	8 29	15 25	26 38	38 84	110	1 82	3 15	118	4 08	9 83
California	95	10 20	15 81	25 09	36 00	109	2 13	3 25	97	4 87	9 83
Oregon	107	8 66	14 25	21 70	30 20	110	2 16	2 96	103	3 38	6 50

EXTRACTS FROM CORRESPONDENCE.

CONDITION AND PRICES OF FARM ANIMALS.

MAINE.

York: Few horses died of the epizooty. *Franklin:* The great hay crop of 1872 makes stock much quieter, and at a much higher figure than in 1871. *Cumberland:* A reduction in numbers of most kinds of stock, and a corresponding rise in price, owing to a large supply of hay. *Waldo:* Farm stock in remarkably good condition; plenty of feed of all kinds. All stock well sheltered.

VERMONT.

Franklin: Mules are a new stock with us, many having been raised here lately. The demand for hay for shipment to the cities has caused a reduction in the stock of cattle, estimated at 5 per cent. *Chittenden:* All stock are wintering well. *Addison:* There are blooded horses raised here, which command large prices. The same is true of sheep; $25 per head for ewes or rams is not an unusual price.

MASSACHUSETTS.

Dukes: There was a disease among our sheep last spring, by which some farmers lost 20 per cent. of their flocks. They were taken with the "snuffles" at first, but soon their heads began to swell, which killed them very soon. I have not learned of any remedy.

RHODE ISLAND.

Washington: Deficiency in hay crops the past two years has diminished the number of cattle from 5 to 15 per cent.

CONNECTICUT.

Middlesex: Probably from 75 to 100 horses have died from the epizooty. *New London:* Some horses have died from the epizooty. Milch cows are scarce, and command a good price. Sheep more numerous than one year ago.

NEW YORK.

Chemung: Hogs are rapidly decreasing, owing to a growing conviction that for the market we cannot compete with the Great West; besides, many are beginning to think that if they cannot raise hogs profitably they cannot use them profitably. *Yates:* December has been uniformly cold and favorable to the feeding of stock. *Steuben:* The horse-disease has been severe and wide-spread. Some have died, and experience has shown that "nostrum mixtures" have done more harm than good. To keep the horse quiet and warm proved the best of all treatment. *Genesee:* Hogs are worth about $4 per hundred, gross. *Seneca:* A few standard flocks of American merinos are kept in this county; also a few thoroughbred sheep as producers of delaine wool; but the great majority are grade sheep kept for wool, mutton, and renovators of the soil. The high price of labor is now stimulating the production of wool and mutton. *Erie:* Very few horses in this section have escaped the epizooty. Nearly every death can be traced to *ill* treatment, or *too much* treatment. Horses which have been worked moderately, allowed to run to grass, sheltered from storms, and have not been *doctored,* have suffered comparatively little. *Ontario:* The epizooty which swept over this county October and November was not fatal to horses, but left them in bad condition, though they are now improving. *Wyoming:* The price of stock is not as high as last year, while hay is much higher. *Onondaga:* Sheep are in good demand for both wool and mutton, and the number has slightly increased.

NEW JERSEY.

Sussex: In November and December horses were attacked by the epizooty; very few died, but some of those were very valuable. Those did best who kept their horses in the stables without giving any medicine, or resorting to any other treatment than due regard to cleanliness. Sheep have increased in numbers during the last year; the reverse is true of hogs. *Hunterdon:* The epizooty has been general among horses and mules; about 60 deaths, confined to the old and infirm or weakly ones. *Mercer:* Very few mules raised in the county. Large numbers are brought from

other States and sold in their unbroken state at about $300 per pair. Early spring lambs sell from $7 to $8 per head at three to four months old, while at one year old they could hardly find a purchaser at $5. Perhaps 500 would not be far from the number of sheep killed in this county by dogs in 1872. *Warren:* There is seldom a mule raised in this county. They are bought in by dealers in stocks when about 3 years old, and sold at about $350 per pair. I have put the average price of sheep under one year old at $4; but lambs sold for market while young, at an average of about $6 per head.

PENNSYLVANIA.

Clinton: Excepting the horse-disease all kinds of stock have been healthy. *Snyder:* Very few horses escaped the epizooty, and very few died with it. *Cambria:* Only such horses as were worked or unnecessarily exposed died of the epizooty. Horses kept warm and clean, not worked or exposed, with light feed, such as bran and boiled oats, with little hay, were successfully treated. There have been introduced several herds of good cattle, which are destined to have great influence on the stock of this county. Distinct Durham, Hereford, and Alderney flocks are now bred pure in this district, and with regular pedigrees. We esteem the Alderneys very much for improvement in our dairies. *Dauphin:* Deaths of horses from a dropsical affection, following the epizooty, are of frequent occurrence. The most effectual remedy has been turpentine applied to the throat and top of the head. *Butler:* The epizooty caused but little damage; hardly a dozen horses died with it; all appear well again. *Lycoming:* A few horses have died of the epizooty, but in nearly every instance the loss can be traced either to improper usage or to the effect of some other disease previously contracted. *Chester:* About 3 per cent. of our horses died of the epizooty. Have rated mules higher than horses because there are fewer very poor ones; the price of good horses is higher than of good mules. *Elk:* Not many fatal cases from the epizooty, and those, for the most part, of horses that had been affected by some other disease. The exceeding cold of the past month has been hard on stock. *Bucks:* Loss of horses by the epizooty not more than one-half of one per cent. Cattle and sheep about stationary; nine-tenths of the cattle are used for dairy purposes. Pork, dressed, is selling at about 6½ cents per pound—mostly used for sausages.

MARYLAND.

Baltimore: Horses will sell high. Mules in good demand. About 300 sheep killed by dogs. *Howard:* Dogs have destroyed the profit of sheep husbandry.

VIRGINIA.

Prince George: The fence law is a barrier to stock-raising. *Pittsylvania:* Cattle and all kinds of live stock inferior. Market facilities do not encourage enterprise. *Montgomery:* Marked improvement in quality of live stock. *Orange:* Increased attention to horses and mules. *Essex:* Sheep fast disappearing before the dogs. Hogs inferior; improved breed of Chester Whites lately introduced. The war depleted the stock of horses, but left some fine breeds descended from American racers, good for saddle and draught. *Augusta:* The number of old horses decreases the average price. *Gloucester:* Bells a partial protection to sheep. *Highland:* Sheep and other stock on the increase. *Rockbridge:* The dog law so unpopular that it was repealed; sheep consequently disappearing. *Southampton:* Dogs very destructive to sheep.

NORTH CAROLINA.

Gates: Epizooty general, but mild; few deaths. *Ashe:* Large numbers of sheep sold to northern markets. *Person:* Dogs very destructive to sheep. *Craven:* Sheep lost 20 per cent. by dogs; stock but a fourth of what it was formerly. *Guilford:* A hog killed here weighed 724 pounds gross, 650 net. *Greene:* All horses and mules had the epizooty; ten deaths. *Montgomery:* Sheep disappearing before dogs. Horse-disease mild. The cotton fever, with the low price of western pork, has killed hog-raising.

SOUTH CAROLINA.

Darlington: Epizooty reduced the price of mules. *Clarendon:* Hog-disease general and fatal. *Stewart:* Hog crop larger than since 1865. *Union:* Horse-disease mild; no deaths; horses worked did as well as those blanketed and nursed.

GEORGIA.

Cobb: Fifty dogs to one sheep. *Douglass:* About every horse and mule had the epizooty. *Wilkes:* Live stock generally decreasing in number but improving in quality.

Schley: General stoppage of business by the horse-disease. *Wilkinson:* Horse-disease prevalent; no deaths among well-kept stock. *Carroll:* Sheep husbandry unprofitable on account of hungry dogs, whose owners do not feed them. *Pike:* Heavy inroads upon sheep by dogs and butchers. *Murray:* Stock has annually increased since 1865.

FLORIDA.

Levy: A few cases of horse-disease. *Taylor:* Great decrease of stock cattle. *Gadsden:* Epizooty mild. *Liberty:* About five per cent. of horses and mules died of epizooty; many died of eating grass with the grass-worm onit, bringing on staggers.

ALABAMA.

Franklin: Horse-disease mild. *Coffee:* Epizooty prevailing; no deaths. *Lauderdale:* Dogs destructive to sheep. *Clay:* Dogs killed 33⅓ per cent. of the sheep.

MISSISSIPPI.

Hancock: Stock decreased by exportation. *Tishemingo:* Few sheep; many dogs. *Wayne:* Numerous deaths of live-stock last spring. *Clark:* Epizooty common but not fatal. *Lee:* Scarce a horse escaped disease, but it was generally of a mild type.

LOUISIANA.

St. Mary: Horse-disease general but mild. *Tensas:* Epizooty mild. *Bell:* Large numbers of horses and mules exported. *Terrebonne:* Great increase of cattle ranging over abandoned plantations. *Caddo:* General decrease of live-stock. *Franklin:* Three-fourths of the pigs die of starvation or by depredations of wild animals.

TEXAS.

Cherokee: Horses decreasing; mules increasing. *Fannin:* Epizooty not more severe than a common distemper. *Johnson:* Horses depreciating through lack of attention in breeding. *Bell:* So many cattle exported that the home stock is almost exhausted. *Dallas:* At the present rate of depletion the herds of Texas cattle will soon be exhausted, leaving room for the profitable raising of finer breeds. Good opening for sheep.

ARKANSAS.

Montgomery: Wolves, wild-cats, and eagles destructive to sheep. *Craighead:* Horse-disease has just appeared.

TENNESSEE.

Williamson: Stock is improving in quality and diminishing in numbers. *Campbell:* Very few horses have died from the epizooty; where well stabled and cared for they have, in almost every instance, begun to recover in ten or fifteen days. Less hog cholera than usual; hogs generally healthy and looking well. *Madison:* Not enough stock raised to supply home demand; horses are brought here in large droves from Ohio and Kentucky, in February and March, and generally meet with ready sales. Cows very inferior milkers—giving two to three quarts when fresh; go dry three months. *Bedford:* Sheep and hogs are increasing in numbers, as farmers are taking more interest than formerly in raising them. *Carter:* The horse-disease raging, but not fatal. Some hogs are dying of cholera. *Bradley:* The horse-disease made its appearance December 10th; so far not a single fatal case. *Cannon:* The condition of stock very good, although the winter has been unusually cold. *Knox:* Horses and mules nearly all affected with the epizooty; very few have died. A warm stable, a dry bed, mild food, very gentle exercise, and avoiding exposure to wind and rain constitute the remedy here; very little medicine is given. No other disease affecting any stock. Sheep-raisers are now changing from the old, almost worthless, to the new and improved breeds. *Monroe:* So far, but few cases of epizooty have proved fatal. Oxen and other cattle have steadily increased in numbers, and with several importations of blooded stock, it is hoped they will improve in quality also. Native sheep have decreased, but some improved sheep have been purchased—a move in the right direction. *Sumner:* Not one animal in a hundred has escaped the epizooty; the fatality has been small, except among jacks and jennets; of these there has been a loss of at least one-third in the county. The disease has left many horses and mules in bad condition for the winter. As a rule, those animals that were given a generous and varied diet, without dosing, did much the best, even though they had no shelter. *Fayette:* Have heard of only one death from the epizooty. It is much more severe in jacks and jennies than either horses or mules. *Gibson:* Fourteen per cent. loss in

hogs from cholera. *Granger:* Cattle, mules, and horses have increased constantly since the war. Sheep have decreased, as many have been driven to Kentucky and Virginia; though some of choice breeds have been introduced. *Hamilton:* No deaths from the epizooty where stock has been cared for. Sheep healthy. Some cholera among the hogs. *Robertson:* The farmers have a surplus of every kind of stock except sheep. *Stewart:* Horses and mules have steadily increased since the war. Oxen and other cattle have also increased in number, so that a great many farmers have more than they can take good care of. Not much hog cholera here the last twelve months. A good crop of corn the last two years has caused hogs to increase in numbers. There is but one man in the county of much means who tries to make a profit on sheep. Mr. James Woods, jr., has some 600 or 700, employs an English shepherd, puts up his wool in good order, and gets the best price. Others engaged in farming have a few sheep, but do not make that a specialty. *Obion:* Nearly all the horses affected by the epizooty, but none have died. *Davidson:* Stock looks well, but feed is becoming scarce. *Giles:* Increased attention would be given to the growing of sheep could we get rid of the worthless curs. No disease among cattle, hogs, or sheep. The epizooty mild among horses, but *very fatal* among jacks. A disposition among all classes to improve their stock of every kind; to cultivate less land, and to make one acre produce what two have formerly. *Fentress:* Mules, cattle, and sheep in better demand, and the surplus stock marketed. Numbers of breeding animals increasing. *Lauderdale:* Horses and mules nearly all affected with the epizooty; but few have died, and they were worked or unduly exposed. Some cholera among hogs has reduced the stock almost half. Cattle are doing well considering the hard winter. *Morgan:* Horses slightly affected with the epizooty; all other stock in healthy condition.

WEST VIRGINIA.

Jefferson: Only five or six of the horses attacked by the epizooty have died. Good nursing, and the smallest amount of medicine possible, (in ordinary cases none at all,) has proved the most effective mode of treatment. But few mules have been attacked by it; they appear to be less liable to the disease than their equine relatives. I do not think that any mules are being raised in this county. Cattle and sheep have gone into winter-quarters in fair condition—rather better than usual. An unusual number of sheep have been killed by dogs during the year. *Braxton:* The epizooty has come over our county like the falling of the dew. As yet but two deaths from it have been reported. The disease seems to be comparatively mild. This, I think, is owing to the elevation of the country, pure air, and sparse population. Beyond care, kind treatment, and good feeding, there has been but little application of medicine. Assafetida, with a little rosin powdered and sprinkled freely in their feed, has served to mitigate the cough. *Fayette:* Not many sheep have been killed by dogs, but a good many have been by wild animals. *Randolph:* The epizooty is prevailing among horses to a considerable extent, but does not often prove fatal. The people are affected with something similar, which I believe to be the same disease. Some few cattle are dying with the black leg. *Monongalia:* I cannot tell the number of sheep killed in the county by dogs, but would say that the sheep business has been almost abandoned on account of the great loss by dogs. *Kanawha:* In several places in the county we have had considerable loss in hogs by the cholera. Some have lost as many as twenty-six good killing hogs. The disease was not general, but confined to spots or places. Sometimes it would skip over five or ten miles, then confine its deadly influence within a space of two or three miles in circumference, and then pass over large districts to some other spot. We have also had something of the prevalent horse-disease, though it has been fatal in only a very few cases. *Cabell:* The horse-disease is now raging in the county. So far the deaths have been few in comparison with the number sick. The result has been to lessen the value of horses and mules.

KENTUCKY.

Butler: Large numbers of sheep have been driven from this county during the past year. Horses of a third rate are very abundant; also a small class of mules. *Jefferson:* The horse-disease has passed by and we have lost but few. This is owing to the care of owners, who have prevented the using of them during their illness. *Laurel:* The epizooty in a mild form has been very general among horses in the county. Very few cases have proved fatal. *Warren:* The number of sheep killed by dogs in 1871, 1,193; value, $3,445. The number in 1872, 801; value, $2,181. These statements are taken from the assessor's books for each year. The number of horses and mules in the county is greater than usual this season, since but few shipments have been made. The owners are holding them for the spring market, calculating that the prices will then be more favorable. *Anderson:* The winter, up to this time, has been remarkably cold and dry; so much so that stock in some parts of the county is suffering for water. The epizooty has been general in the county, among

horses and mules, but the fatality has been slight, only two or three horses having died. It has now about spent itself, most of the animals having recovered. I hear of a few cases of what seems to be the same disease among horned cattle. *Grant:* I did not send the former reports from the fact that the epizooty was so bad that we had no conveyance for some time. The disease is now about over and business is reviving. *McLean:* There has been no disease of any kind among stock, except horses, all of which have been affected with what is called the epizooty, but it has been very mild and I have not heard of a fatal case in the county. *Mercer:* With regard to the horse-disease which has been prevailing through the county, it has not been so fatal with our horses as it is reported to be in other States, but the mortality with jacks has been very great. *Metcalfe:* The epizooty has prevailed generally during December. It did but little damage to horses and mules, but was very fatal to jacks. More than half of the jacks which were affected with the disease have died. It has now nearly disappeared. *Ohio:* The epizooty has been almost universal, but is subsiding; deaths few, but from the condition horses are left in, fears are entertained that they cannot stand hard service for some time. *Taylor:* The price of horses is low, owing to the limited demand at the south, and to the universal prevalence of the epizooty, which has put them in bad condition, but killed very few. The number of mules on hand is greater for the reason that but few have been sent south as yet, the disease and low-market rates causing the farmers to hold on for better prices. The cattle raised in this county are principally "scrub stock." *Spencer:* The epizooty prevailed only partially with horses and mules, none dying from it; but it has proved fatal to a number of jacks. *Boyle:* Ninety per cent. of the horses and mules have been affected with the epizooty, and are now fast recovering, the loss being only about 3 per cent., but over 50 per cent. of the jacks and jennets have been lost by this disease; very few of the former recover. The *fear* of dogs prevents increase in flocks. If owners of dogs were held strictly liable for the killing, or such a heavy tax *levied and enforced against dogs and owners* as to lessen the number of worthless curs, the number of sheep would be doubled very soon, and the cost of keeping them would not be felt by the farmers. *Owen:* The epizooty has prevailed in this county, but no deaths have resulted from it. The horses that run out to grass were affected but slightly, while those that were kept in stables or highly fed suffered the most. *Larue:* There is in our county a disease known as sheep-cholera, or scours, which has killed a great many sheep, mostly those under one year old. We would like to have some one find a cure and report it.

OHIO.

Coshocton: The epizooty seems to have been a benefit to the horses in the agricultural portions of this county. Coming, as it did, after the farm-work was done, the stables were put in good repair and unusually good care taken of the stock; so that at this date our horses are above an average in good condition. Nearly all the horses in our towns and villages had the disease; the only deaths reported were of horses of little value. No death has been reported among the farm horses and less than 50 per cent. of them were attacked, and that in mild form. *Franklin:* The epizooty is about over in this county. All young and healthy horses have come out of it well and sound, when not abused by their owners or drivers, and not maltreated by some veterinary quack. I have learned of several cases of steaming the head and neck of young sound horses, in each of which death ensued. Of horses which have had good care, corn-fodder and a little corn as food, have been kept warm and given only very moderate exercise, 99 per cent. have recovered. Where immoderate exercise has been given so as to heat up the blood and then take cold in cooling off, death has been the usual result. *Logan:* The partial stoppage in the shipment of horses last year, added to their relative numbers, has had a tendency to discourage breeders. The upward tendency in the wool market during the last two seasons, having caused a corresponding rise in the value of sheep, has nearly put a stop to the practice of fall-pelting for the pelt and tallow. *Trumbull:* We have had the horse-disease throughout our county. But few were lost; none where quietness and light use were observed. *Williams:* Farmers are pretty nearly all going into stock more heavily, especially horses and sheep. There has been a growing demand for both these classes; we have not quite kept up with that for sheep; for horses we have about held our own. *Crawford:* The epizooty has nearly subsided, very few horses have died. Very few mules in the county. Sheep are well cared for and the number larger than a year ago. Hogs very abundant and very cheap. *Lorain:* Horses got through with the epizooty better than was anticipated; only sixteen are reported to have died by it. Most persons are more careful in blanketing their horses than formerly. In that sense the disease has been a benefit. *Tuscarawas;* The short supply of the hay crop, in connection with the consumption of straw by a paper manufactory in the county, and the early setting in of winter, has caused feed other than grain to rule high in price, and a consequent reduction in the value of stock. *Hancock:* Horses passed through the epizooty all right, no case in this county proving

fatal; good care, plenty of feed, and moderate exercise being all the medicine required. Our crop of hogs is being diminished, from the fact that in the market pigs are worth more per pound than heavy hogs. The county is overstocked with milch cows, there being no demand for them. *Delaware:* Though sheep are not gaining much in numbers, they have gained in quality and health at least 10 per cent. over the last few years; "foot-rot" seems to have worn out. Hogs are also of better quality; although fewer in number, it is thought there will be considerably more pork made this season than last. *Erie:* Our horses are coming out of the epizooty all right; no deaths in the rural districts; a few only in the city. *Medina:* Stock, especially neat cattle, unusually low in price. The very cold weather gives our animals a ravenous appetite, and the farmers apprehend a scarcity of fodder. This is one cause of low prices; another is scarcity of money. *Morrow:* Owing to the scarcity and high price of rough food, cattle are not as high as last year; milch cows have depreciated at least one-third in price. The fever for sheep not as great as a year ago; considerable of the last clip on hand. Hogs in good demand, owing to the abundant corn crop. Stock generally look well. *Perry:* The shortness of rough feed has materially lowered the price of cattle, especially of young cattle. Last year the assessors' returns showed 237 sheep killed by dogs; not quite so many in the year just closed.

MICHIGAN.

Calhoun: After inquiry, I find that five or six horses in the county have fallen victims to the epizooty. Within three weeks after its first appearance it spread rapidly over the county, and for about two weeks horses were scarce on our streets. As a general rule horses have been kept from labor or exposure. This, with good care in a great majority of cases, has proved all the treatment necessary for a speedy cure. The only species of stock which maintains its standard of value, as compared with the past year, is sheep; oxen are stationary. All else has depreciated in value. *Wayne:* Excepting sheep, stock of all kinds is lower than last year at this season. *Washtenaw:* The price of beef $5 to $6, and of pork, about $4.50 per hundred pounds. *Tuscola:* Sheep are high and in demand. Hogs are low in price. Pork-raising has not been a paying business for the past year. *Cass:* Feeding-time commenced earlier than for several years, and our winter has been so far very cold, with heavy snow. Cattle are doing well where properly cared for, as it has been dry. *Clinton:* In one instance all the sheep a man had—twenty long-wool animals, which he had taken great pains to procure—were killed by dogs. *Ottawa:* The horse-disease is yet very prevalent, but of a mild type; but few have died, and those of an inferior class.

INDIANA.

Gibson: The epizooty in nearly every stable. Cattle and other stock are generally healthy. *Grant:* There is some trouble among cattle, a kind of stiff rheumatism, which lasts about ten days. No deaths from it so far as I know. *Versailles:* The epizooty as yet has been in a mild form. It has proved fatal in but few cases, and those were old and broken down horses. A disease among hogs, known as hog-cholera, is prevailing in some parts of the county, but there have not been many deaths from it. I think that the death of hogs from other causes is frequently charged to hog-cholera. Flocks of sheep have been largely diminished this last fall by the butchers, but what are left are in fine condition: no disease among them, and none among the cattle. *Hamilton:* Horses are very cheap; cattle and hog-markets extremely dull. *Fountain:* Hogs are very fat and weigh heavy; all other stock is in fine condition except horses; they have suffered much from the prevailing distemper but are now, with but little fatality, rapidly recovering. *Lake:* In this county there is a considerable percentage over any previous year of all kinds of stock, with perhaps the exception of sheep. The extremely dry weather is very seriously affecting the farmers in procuring water for stock. Wells, never before known to fail, are giving out all over the county. *La Porte:* This county is well supplied with horses, mostly medium sized; the market for such is always dull at this season of the year, but in two months from now will be more active and prices 10 or 15 per cent. higher. The price of sheep has considerably increased during the year. Hogs are much lower than they were last year. *Martin:* The horses of all ages, as well as mules, in the county, have been subject to the epizooty, which has prevailed for the last two months, with very rarely a fatal case. Nearly all are now either well or improving. Something of a similar nature has prevailed during the same time among the people. *Franklin:* The only danger to horses and mules from the epizooty, from a relapse caused by working the animal too soon. Hogs are much below the cost of production. Price of product regulated by "rings;" ruling rates $3.25 to $3.50 per 100 pounds gross. Remedy: lessen the supply. *Scott:* About half of the horses in the county have, or have had, the epizooty; no case fatal. *Brown:* Scarcely a horse, mule, or ass in the county, but has been attacked with the epizooty; thus far but few deaths have occurred. This disease in

many respects resembles pleuro-pneumonia. The only remedy I know is, to keep the animals warm, and not overheat or overwork them. *Kosciusko:* The epizooty has prevailed all over the county, but no fatal cases where the horses were in good health and flesh when attacked. *Owen:* Horses have increased in number and decreased in price. Mules not sought, and therefore not bred the past year. Cattle have increased because of increase of pasturage. Sheep have decreased because sought for at tempting prices. Hogs healthy and at fair rates. No mast this year. Average supply. *Putnam:* The number of sheep killed by dogs the past year has been unusually large. *Stark:* Stock has suffered some in this county for the want of water, also from the severe cold weather where they were not provided with shelter, a great many having to lie in open fields on the snow. *Newton:* Very few sheep in this county. Some four years since our farmers were anxious to engage in sheep-husbandry, and a great many sheep were imported with foot-rot, which was communicated to the native sheep. Disease and the low price of wool induced the farmers to dispose of them. Cattle can be raised on our rich prairie lands at small cost. Prairie hay can be bought for $2.50 per ton and corn for 25 cents per bushel. Railroad freights are the great drawback to successful stock and grain raising. But little attention has been given to improved breeds of horses and cattle. In the hog line we have the Poland, China, Berkshire, and Chester White. A great many hogs and cattle are annually shipped from this county.

ILLINOIS.

Cook: Our county is becoming overstocked and dairy products declining in price, and we have disposed of a share of our cows. *De Kalb:* There is a sensible increase in cattle, but a depression in price, as in the hay crop. Owing to the advance on wool, sheep are on the increase, and bear better prices. Milch cows are not as high as they were one year ago. Cheese making has become an industry in De Kalb County. Not less than 500,000 pounds of cheese have been manufactured the past season, which will give a return of at least $60,000. *Madison:* The land in this section being all improved, there cannot be great changes in the number of animals, unless the agricultural system be considerably modified. The breeds, however, show some improvement on the old ones. *Stephenson:* The number of sheep within the past few years have materially decreased, but for the last year it has been kept up, since wool has advanced sufficiently to make the production a paying business. *Bureau:* Horses are low and sales few. Mules are increasing; sell higher than horses. Sheep are scarce; but few flocks in the county. Some are beginning to talk sheep again. Good milch cows with calf by the side, sell for from $25 to $50. *Effingham:* Stock has wintered well this far in all cases where they get water regularly. *Kankakee:* The number of cattle is diminishing on account of the want of outside range. Very few sheep are kept; the number of dogs discourages the raising of them, since they cannot with any safety be left in the pasture over night. *Boone:* Recently a farmer lost fifteen sheep, out of his flock of twenty-one, by dogs in one night. *Clinton:* The drought is unprecedented in this county. The difficulty of getting water for stock is great. The epizooty is prevalent; I think one hundred will cover the loss of horses and mules. As far as I have been able to ascertain all that have been bled have died. *Crawford:* Epizooty in abundance, but few fatal. Weather dry and cold, and water scarce. Stock have suffered in some parts of the county. *Lawrence:* The epizooty very light on the farm horses; very few deaths. *Marshall:* Owing principally to the lately prevailing epizooty corn was not all gathered. *Grundy:* Stock of all kinds generally in good condition. *McLean:* Almost every horse in this county has had the epizooty within the last month, but are now mostly over it. Not more than 90 have died, those being kept in cities, in close warm stables. Horses of considerable Norman blood, of which there are a good many in the county, are much higher than the average. Those weighing 1,100 pounds and upward have been shipped almost constantly from Bloomington, at an average of about $135. Oxen and other stock look well, a large number being Texas and Cherokee cattle. Sheep healthy; look well. Long-wool and other mutton-sheep are receiving more attention. Hogs have been made unusually large and fine by plenty and cheap corn. *Hancock:* The horse disease has been general; the fatality has not been more than two per cent., and then attributable to overuse or bad treatment. Close observation and inquiry warrant the belief that blanketing and medicine do more harm than good, except in extreme cases. Care, abstinence from work, and allowing them to run loose where it can be done, have shown the best results. *Lee:* Cattle, sheep, and hogs are wintering well. The horses have generally recovered from the epizooty, and, so far as discoverable, it has left no bad effects. The people are complaining of low prices for produce and high taxes. *Ogle:* Nearly all the horses have had the epizooty; the most of them have recovered—a few died. Mild remedies, proper care, and rest, have proved to be the best treatment. Horses, cattle, and hogs continue low in price and of dull sale. Sheep have appreciated in value. *Sangamon:* The epizooty made its appearance in this county about the 30th of November. It has

shown itself here in a milder form than usual, or else the newspapers have made an unnecessary ado about it in the East; although perhaps every horse in the county has been affected, the fatality has amounted to almost nothing. *Fayette:* Sheep have not been destroyed to the same extent as in former years. *Franklin:* A large number of our most valuable cattle and sheep have been bought up and driven off. This reduces the average price per head, and makes lambs average higher than old sheep. *White:* We have had the epizooty all over the county; but it has nearly disappeared, with but trifling loss.

WISCONSIN.

Dodge: The epizooty has been prevalent, though few cases have proved fatal. *Juneau:* Horse-disease in full blast throughout the county; a number of cases have proved fatal; great success has attended the following treatment: when first taken give a half pound of common ginger in four quarts of bran once per day for two days; all horses fed in this way get over the epizooty in one week. *Portage:* Ninety per cent. of the horses in this county have had the epizooty; not more than ten have died; good treatment without medicine has proved the best remedy. *Green Lake:* Working oxen sold for high prices for a short time, but with the disappearance of the horse-disease cattle fell back to their old position; butter and cheese are low in the market, which makes cows slow in sale and dull in price; sheep are doing better; hogs are the most unprofitable animals on the farm, as pork sells now at $4 per hundred pounds. *Richland:* Very cold during the last month; the thermometer has indicated 37° below zero; it has been very hard on stock, as the farmers have not got their sheds fixed up for them; pork, $3.75 per one hundred pounds; beef, about $2.50 live weight; red wheat, $1.22; white, $1.32; rye, 60 cents; and corn 30 cents per bushel. *Calumet:* About one-third of our cattle are of improved blood; they bring a better price by one-third than those of common breeds; the same is true of the improved breed (Cotswold) of sheep; according to the assessor's table there are in the county 3,099 horses, 55 mules, 10,467 cattle, 9,906 sheep, and 6,671 hogs. *Jackson:* Durhams, when over half-blood, bring fully double price, either for beef or stock. The same is true of South Down or Cotswold sheep. Money matters worse than in 1860. *Adams:* Beeves are worth about 3 cents per pound live weight.

MINNESOTA.

Blue Earth: Horses all sick; not more than 1 per cent. of the cases fatal. Cattle are not wintering very well. *Faribault:* The epizooty prevails; few if any horses escape it. Those horses and colts which are allowed to range the fields during the day and are stabled nights have the disease lighter and do better than those which are stabled all the time and well cared for. Not many losses from the disease in the county. *Murray:* The percentage of sheep, cattle, and horses is greater on account of the rapidly increasing population; it more than doubled in 1872. *Nicollet:* The epizooty prevails universally, but very few horses die with it, unless they are exposed or have a relapse. *Steele:* This county has no superior for stock-raising and dairy purposes, and farmers are giving more and more attention to these branches. *Winona:* Good working oxen have advanced 25 per cent. within a short time, on account of the horse-disease. *Sibley:* All cattle have done well the last year; very few have died from disease.

IOWA.

Powesheik: A great many pigs have died from the hog-cholera. *Story:* The prices of horses and mules rule low just now, on account of the epizooty which is raging, but with no great fatality. *Guthrie:* The number of sheep killed by dogs is not large. If a dog worries stock of any kind he is generally killed; our law gives that privilege. Cholera has thinned the hogs to a considerable extent, and the low prices—$2.50 to $3 per hundred—has discouraged many hog-raisers; but there is a marked improvement in the breeds. Our horses are having the epizooty very lightly; but few fatal cases. Those running out in pasture seem to do better than those kept up. *Muscatine:* The epizooty has about run its course; very few cases fatal. Rest, keeping them warm, and good feed seems to be about all the treatment required. Horses are plenty and no sale for them. This county being noted for its speedy horses, mules are not much in use; yet if true economy were practiced there would be many more of them. I am fully convinced that "the best horse for all work is the mule." With a slight increase in cattle, prices tend downward; all are doing well. Our winter, until recently, has been dry and cold; once 30° below zero; but by abundance of feed and good shelter, their backs have been kept flat. In some sections a scarcity of water causes an increase of care. Milch cows are more in demand. Butter and cheese will receive more attention, and cereals less. Sheep are very much sought after. Hogs in almost any amount; Poland, China, Chester Whites, Berkshire, Cheshire, Suffolk, Essex, and all the varieties of crosses that can be thought of. A disease in the northeastern part of the county is causing much

alarm. It is generally called "cholera," but from the symptoms described I am of opinion that it is an anthrax fever. Some are killing their "stock hogs" and running them into market. *Iowa:* Cattle and hogs are healthy and looking well. The sheep in this county are generally herded in large flocks on the open prairie during the day, and put in pens at night. The epizooty has prevailed in a mild form almost universally among horses and mules; a few have died. *Lee:* The decrease in the number of cattle in this county is owing to the fact that during the fall we sold to drovers five times as many, principally steers, as we ever sold before, at an average price of four cents per pound. *Louisa:* The epizooty has been quite general, but as yet no deaths. All kinds of stock are in first-rate condition. The low price of corn and of hogs has a tendency to make dull times. When it takes three and a half bushels of corn to get one to market, we feel that it does not pay to raise it. *Appanoose:* In this county the sheep are thinned out for mutton, and unless a change takes place this branch of husbandry will soon be lost sight of here. *Cass:* We are in the midst of the epizooty, but have heard of no deaths. *Delaware:* The epizooty, in mild form, raged here through December, and scarcely a horse escaped. Probably not over twenty have died from it. *Hardin:* The large increase in milch cows is explained by the fact that several cheese factory companies have been organized, for the supply of which cows have been purchased in other sections. *Logan:* The epizooty is prevailing extensively, but not fatally. The price of horses has perhaps somewhat declined. The quality of stock in horses, cattle, and hogs is being improved. Cattle and hogs are the main sources of profit to the farmer. The number of sheep continually decreases, and is likely to, since the law requires them to be restrained. *Johnson:* The epizooty has come and gone, and few horses have died. Horses are now in good condition. Wolves have killed quite a number of sheep during the year. *Linn:* Prices of live stock are depressed. Oxen are scarcely used for work at all, and are worth what they will bring on the scales. Mules are slowly making their way into favor, and are being raised a little more from year to year. *Montgomery:* The epizooty has prevailed the past month—fatal in but few cases, say five or six in the county. *Floyd:* Epizooty very light; not a death within my knowledge. *Howard:* From December 19th to the 26th the cold was hard on stock, reducing the percentage of all kinds exposed. *Pottawattomie:* The decrease in mules is owing to an increased sale the past year for Texas railroad purposes. *Tama:* The epizooty is having its course; not fatal in many cases. Horses have increased in number but diminished in price. Stock hogs are scarce but low in price. Cholera has killed 25 per cent. of all the hogs, old and young. Fat hogs have ranged at $2.75 to $3 per hundred, gross. "Chicken-cholera" has proved fatal among turkeys and chickens. *Scott:* The epizooty has passed over, and from the rest and good care it occasioned has apparently left the horses in better condition than before; but few have died. Sheep husbandry is nearly abondoned here. *Mahaska:* Horses have all suffered from the epizooty; but few fatal cases. They are recovering rapidly. Hogs have died in large numbers from cholera or kindred diseases. Cattle are healthy. *Plymouth:* The epizooty is now prevailing; no horses have died save overworked ones. *Winneshiek:* Probably 90 per cent. of the horses in the county have had the epizooty recently, but not more than 1 per cent. have died. We think it has been demonstrated in this vicinity that horses which were exercised regularly, and even worked with discretion, have fared better than those that were nursed too tenderly.

MISSOURI.

Barton: Stock suffering for water. *Caldwell:* A moderate increase of stock of all kinds. Some calves and yearlings have died of a disease about which opinions differ. Many young pigs died in August, September, and October, of some lung disease, attended by a hacking cough. *Clinton:* Many horses now have the epizooty; no deaths reported. All other stock healthy. *Platte:* The epizooty prevails extensively among horses and mules; only one death heard of. Otherwise stock of all kinds in good condition. No demand for stock except cattle and hogs; the latter on the decline. *Adrian:* The epizooty almost universal among horses and mules: not more than 3 per cent. of the number attacked have died. *Harrison:* The epizooty raging, but not fatal. *Washington:* The epizooty has appeared within a few days, in a mild form, but the cold and wet weather is unfavorable. Many oxen were shipped from this county to Saint Louis during the prevalence of the epizooty there. *Iron:* The epizooty among horses, but very mild; only a few deaths. *Marion:* Horses and mules generally affected with the epizooty; not many fatal cases. *Pike:* Horses and mules all have the epizooty at this time. Cattle very healthy. As wool is high, sheep have increased and received a better attention. Fat hogs very low; selling at $3 per hundred, live weight. *Greene:* The horse-disease at its height; have heard of no dangerous cases. *Stone:* The condition of horses, mules, sheep, and hogs, better than at this time last year; of cattle, not so good. *Newton:* The epizooty here in a mild form; seldom fatal. The health of other domestic animals good. *Carroll:*

The epizooty has temporarily disabled a great many horses; deaths very few Cattle, sheep, and hogs doing well. A few isolated cases of hog cholera *Lincoln:* The epizooty appeared about the 1st of December; in a few days almost every horse in the county was infected; only 2 deaths heard of. *Perry:* The epizooty, of a mild type, in full blast. In this county the cattle are generally of the scrub breed; very few of improved breeds. The price of hogs very much depressed. *Lawrence:* The epizooty raging, but not fatal. *Nodaway:* The number of sheep is believed to be decreasing, owing to the numbers killed and to disease. *Sullivan:* Epizooty prevalent in a mild form; no fatal cases reported as yet. *De Kalb:* The horses are now afflicted with the epizooty; have heard of only 2 deaths. In its western course its severity is mitigated. *Pulaski:* There seems more disposition than formerly to improve the breeds of sheep and hogs. *Maries:* Horses have suffered some from the epizooty, but scarcely any mortality. Nearly all kinds of stock in bad condition for winter, but cattle very healthy; sheep generally so; hogs lousy and looking bad. All kinds of fowls have suffered from the extreme cold weather. *Moniteau:* The epizooty has swept over this county without any damage; stock looks well. *Taney:* More sheep have been killed by dogs and wolves (mostly by wolves) in 1872 than for five years before.

KANSAS

Republic: Sheep have been moved farther west. Some talk of bringing in sheep from Missouri. *Crawford:* The epizooty has much reduced the prices of horses and mules. *Doniphan:* The epizooty rapidly extending over the county; few fatal cases, but a general stagnation in moving farm produce. The heavy crop and low price of corn will give an impetus to the stock interest. Although the price of beef and pork is low, farmers generally find it more profitable to convert as much of their grain and other crops as they can into these articles, as they are thus in a shape to be nearly always turned into money, and require less labor and expense in moving. The sheep interest in this county, now scarcely worth mentioning, grows less every year. *Jefferson:* The large increase of cattle is due to the bringing in of Texas cattle by farmers generally, to consume the large surplus corn crop. All stock low in price on account of the extreme scarcity of money. *Centralia:* About two per cent. of yearlings and one per cent. of two-year-olds have been lost by black-leg. All kinds of stock were taken off the ranges fat last fall, have been well cared for, and look remarkably well. *Cherokee:* The horse-disease has been very general, but mild; few remedies used, except good treatment. Most farmers in the county are disposing of their Texas cattle and raising more domestic breeds. The average grade has improved in quality 25 per cent. within the last two years. *Lincoln:* A few droves of Texas cattle are being wintered here, and for that reason the number of oxen and other cattle has fallen off since January, 1871. The number of milch cows is steadily on the increase. Sheep have also been brought in plentifully, and the probability is that within the next six months they will double in number, since a number of sheep men from Iowa are coming with their droves in the spring. *Sumner:* The low price of cattle is attributable to the fact that much of our stock is Texan. Hogs are worth 5 to 7 cents per pound; work-oxen $40 to $80 per yoke. *Dickinson:* The epizooty, in a mild form, is general; very few deaths. *Marion:* A great many Texas ponies in the county make the average price of horses quite low. A great step has been taken to improve the cattle in the county; there have been brought in, by two parties, sixty or seventy fine short-horn bulls, some of them splendid animals, valued at $3,000 each. *Osage:* The mules and sheep in this county are too few to enumerate. Horses and cattle are all lower in price than last year. *Morris:* Stock of all kinds a little lower than one year ago. *Atchison:* Horses have declined in price since the epizooty broke out. Cattle declined in the fall on account of the Texas fever; but that having abated, the demand and price are now increasing. *Labette:* We have a better stock of horses in the county than a year ago. The old scrub-ponies are disappearing, and improved breeds are being brought in to fill their places. On account of the epizooty reaching our county, the price of horses has fallen 20 per cent. within the last two months. The increase in cattle has been nearly one-third greater than last year, principally in cattle driven in from Texas since cold weather set in. The cattle in this county were freer from disease the past season than ever known before; did not hear of a single case of Texas fever, or any other fatal disease. This is owing to the fact that the legislature of this State, last winter, passed a law which forbids all kinds of domestic animals to run at large, unless under the care of a herder, to go into effect in each county whenever it so voted. This county adopted it, and that law was the means of keeping the Texas fever out of the county. No cattle were seen roaming over our many acres of uninclosed prairies, and occasionally breaking into our inclosed pastures and spreading disease among our native stock. Now that farmers are compelled to keep them from roaming at large, they fix better pastures and take better care of them. *Montgomery:* The epizooty is prevailing extensively, but hardly ever fatal. The great increase in the percentage of horses and cattle is due mainly to immigration. *Sedgwick:* Under our system of herd-law, there are few horses and cattle raised; supply from Texas, do-

mestic cows, $40 each; Texas, $20. *Bourbon:* The horse-disease is general; few deaths. *Linn:* Have heard of but three deaths from the epizooty in the county. Stock hogs have been in great demand. *Butler:* A good deal of sickness among horses. Stock hogs are worth 5 cents per pound; dressed pork the same. For the first time in this county, farmers are stall-feeding cattle. *Cowley:* The epizooty is here in a mild form. Sulphur, relaxing food, and good attention is all the treatment needed. *Lyon:* The epizooty, in mild form, prevailing generally among horses and mules; some mortality in cases where the animals were driven while sick. *Washington:* The prices of horses and cattle have been depreciated by the epizooty and scarcity of money. The low price of grain has made a demand for stock hogs. With one of the best sheep-raising regions in the world, we still have no sheep, and farmers find that it takes all the grain they raise and half the farm, at present prices, to clothe their families. The great want of this county is sheep and wool. *Smith:* This being a new-settled county, the increase in stock is large. Improvements are going on rapidly, and the county is bound to become an important one in a short time. *Jackson:* Milch cows have depreciated in value more than any other class of stock.

NEBRASKA.

Merrick: The epizooty in full force; no deaths. Sheep are doing well. This is a splendid country for the production of wool, though we have small flocks at present. *Lancaster:* All the horses affected with the epizooty in a mild form; they get over it in eight or ten days. Have heard of but one or two fatal cases. *Gage:* The horse-disease raging, but light compared with other places. *Pawnee:* So far as heard from, only one horse in the county died from the epizooty. One-year old stock hogs sell for $1.75 per hundred; fat hogs for $2.50. *Cass:* Scarcely a horse or mule in the county has escaped the epizooty, but few cases fatal. *Johnson:* The epizooty has visited this county, but, so far as heard, no case has terminated fatally; but very little treatment is resorted to. The fall rains kept the pastures in good condition for grazing, until quite late in the season; consequently all horned cattle went into winter quarters in good condition, and they continue so. In consequence of the enormous yield of corn this season, and the very low price for the same, every hog that will make pork at all will be fattened for market. *Nemaha:* The epizooty has proved fatal in but very few cases, and those generally where other disease prevailed with it. A large surplus of horses in the county, and no market for them; mules increasing rapidly in number and quality; number of horses in the county, 3,949; of mules, 351; of cattle, 7,780; of hogs, 14,409; of sheep, 1,632. The most of the latter have been brought in recently. *Boone:* Cattle generally look well; no corn, but plenty of hay.

CALIFORNIA.

Del Norte: Stock in good condition; good work-oxen worth $150 per yoke. *Plumas:* Cattle and horses in good health; few sheep kept in this county. *Napa:* This is not a stock-raising county; our products for market almost exclusively wheat and wine. *Alameda:* Stock of all kinds looking better than usual at this season. *Placer:* The horses in this county have been much improved; those now bred are from the very best stock; mules are coming into more general use; oxen and other cattle are only raised in our county for use, not for market. Sheep are a source of large wealth to our county and are on the increase; they are considered the most profitable stock raised. Hogs suffered the past year from hog-cholera; fully 25 per cent. died of that disease. *Sonoma:* The decrease in cattle is owing to the past unfavorable season, which caused stock-raisers to reduce their herds—many ranges having been overstocked. The same cause has lowered the prices of stock. *Sacramento:* Our stock of cattle and hogs has been much reduced in numbers the past year on account of the abolition of our fence laws, requiring owners of stock to pay all damages from trespasses on lands not fenced. *Amador:* Sheep are always herded and the loss by dogs is very small. *Mendocino:* A great change in the number and character of our horses within a few years; the old Spanish stock has been well-nigh exhausted, and a much better has taken their place, but in much smaller numbers. *Kern:* Sheep-men have been improving the stock the past year; large importations from Vermont and New Hampshire.

OREGON.

Union: Crossing American with Indian horses is becoming quite a business and will prove remunerative. *Clackamas:* Cattle are doing well as yet without other shelter than that of timber. There is a small decrease in the number of horses owing to the fact that many are bought up in this and the adjoining counties for the California and territorial markets. *Grant:* Our farmers are gradually getting rid of their poorer stock of horses and introducing those of superior blood. We have now in the

county two fine stallions, one a thoroughbred, sired by Lexington, imported from Kentucky, and valued at $1,500; the other a four-year old colt, Morgan on the one side and supposed to be Hambletonian on the other, valued at $2,500. No disease among horses in the county. *Lane:* The sheep interest has declined somewhat within the last two years. *Clatsop:* The fall and winter, so far, have been very favorable for stock; no feeding done yet, (December 21.) Prices of live stock about the same as last year; grain and vegetables some lower. *Benton:* All kinds of stock doing well; prices of stock have declined from 10 to 20 per cent. since last spring. *Multnomah:* Stock of all kinds in good condition; feed plenty. No disease among the cattle, sheep, or hogs, and no epizooty among horses. *Douglas:* Neat stock of all kinds, except working oxen, (of which there are not more than 6 or 8 teams in the county,) are increasing in numbers, but not in value as compared with last year. Sheep are some higher than last year and in active demand. In one of the smallest precincts 200 sheep were killed by dogs; so many dogs are a curse to wool-growing. Hogs are on the decrease; farmers get rid of them as they go into wool-growing. *Tillamook:* Sheep have done well the past year. Dogs do not kill our sheep; we keep a good many hounds to run the panthers and wolves; if we had no dogs we should very soon have no sheep. *Marion:* There is no perceptible desire to extend the breeding of horses for profit; cattle and sheep receive much more attention. The prices of cattle generally are declining by reason of large numbers being brought into the State from Texas. Attention is now turned more to sheep than to any other stock, and prices are stiffening in consequence. Stock is generally looking extra well for the season.

COLORADO.

El Paso: Stock doing exceedingly well; game plenty, especially the buffalo. The absence of the raven and magpie a remarkable feature of the winter. *Weld:* About one-tenth of the cattle in this county are from Texas. *Douglas:* All stock in good condition; fat cattle and sheep taken constantly from the range by the butchers.

UTAH.

Beaver: Sheep being kept on the public domain without shelter; many of the spring lambs die during the cold storms—about 10 per cent. of the whole number. *Kane:* Horned cattle are raised mostly for the beef-market in the mines, and having had good ranges both for summer and winter, they have paid extremely well. Sheep have done well; heavy fleeces and well fattened on the range. Hogs are not allowed to run at large in this county, but there are some as fine varieties here as can be found in the Territory.

DAKOTA.

Lincoln: There seems a disposition among farmers to sell their cattle and pay more attention to hogs. This is on account of the herd law, which compels us to herd cattle the whole year.

ARIZONA.

Yuma: All stock are in fine condition.

MONTANA.

Lewis and Clarke: For the first time in the history of Montana Territory beef-cattle are being driven to the line of railroad in Utah for market.

IDAHO.

Nez Perces: Only hear of one flock of sheep in the county. Horses have been doing pretty well without any feed; cattle not so well.

NEW MEXICO.

Mora: Heretofore mules have not been an item of production in this county, but Mr. Enoch Tipton, an enterprising farmer, is now turning his attention extensively to the raising of them.

WASHINGTON.

Thurston: Hogs are exported in large quantities to Victoria, British Columbia, and dressed beef, mutton, and salt meats to milling towns.

EXPERIMENTS WITH FERTILIZERS.

Seneca County, New York.—In the fall of 1869 I purchased three barrels (about 700 pounds) of Crosdale's superphosphate, at the rate of $60 per ton. This I applied to

wheat at the rate of 100 pounds per acre. I used the "Farmers' Favorite" drill with fertilizing attachment, which conducts the fertilizer through the drill-tubes into the ground in immediate contact with the grain. I seeded with timothy at the same time. The wheat crop was apparently benefited 20 per cent., and according to our best judgment the grass crop that followed showed an increased yield of 25 per cent.

To ascertain the effects of the superphosphates in subsequent experiments, here alluded to, I repeatedly crossed and recrossed the fields with the fertilizers shut off. In the fall of 1870, between the 7th and 15th of September, I put in about thirty-eight acres of winter wheat; six acres were on raw ground, moderately manured from sheep-sheds and the barn-yard, and summer-fallowed; eighteen acres on clover and timothy sod once turned and afterward cultivated; and fourteen acres on oat-stubble well worked. Upon a part of the latter some manure was drawn and about 150 bushels of ashes, the major part unleached. These manures were evenly spread and plowed under, not covering more than five acres. When ready for seeding, I applied to the six acres of summer-fallow and to the larger part of the oat-stubble ground a mixture of seven parts of ashes to one of common salt, at the rate of 2½ bushels per acre.

Upon the remainder of the oat-stubble ground and upon the sod-ground, I applied gypsum at the rate of 2½ bushels per acre. The long-continued drought prevailing at that time had caused the earth to be as nearly destitute of moisture as it could be, insomuch that not a few farmers sowed portions of their fields the second time. Under these circumstances, the immediate effect of the fertilizers was to delay the germination of the wheat. Hence, that sown on the plots with the fertilizers shut off came up first, and for a time looked the most promising. But in due time the fertilized portions came up with a strong plant and with a much darker shade of green. This difference in stock and strength of color continued, with slight variation, until the ripening commenced, and from that point until harvested, the fertilized portions could be distinctly discerned by the clear, white straw; that on the unfertilized strips, particularly of the Lancaster and Treadwell varieties, being more of a weather-beaten color. The excess of well-matured grain on the fertilized portions was so apparent that I collected a bundle of each, (fertilized and unfertilized,) growing only the width of a drill-mark (eight inches) apart, and threshed them separately. I found the quality of the grain decidedly in favor of the fertilized wheat.

The total yield of the 38 acres was 1,160 bushels, 20 per cent. of which, I think, was due to the fertilizers thus used; gypsum giving the largest per cent. of increase and producing the most lasting good effect. This year, 1872, I have taken from the same ground a crop of red clover, and subsequently a crop of clover-seed. The increase in each clover crop, where the gypsum was used, was at least 50 per cent.; some of my neighbors estimating it much higher. The difference was not so marked where ashes and salt were used.

In the falls of 1871 and 1872, respectively, I applied to my wheat-fields, at the rate of two bushels per acre, gypsum and salt mixed in the proportion of three bushels of the former to one of the latter. Although the drought of 1871 held through the winter and up to near the time of harvest, causing almost an entire failure of the winter-wheat crop in this vicinity, yet very much of the wheat I did have was traceable to the use of the aforesaid fertilizers. How the crop now on the ground will be affected, remains to be seen. A mixture of salt and gypsum applied in this manner tends to keep worms from the root of the plant, and I incline to the belief that it is a preventive of smut. I use the same application upon my corn-ground before marking and planting; also upon oats, except when sown on corn-stubble, in which case the previous treatment is deemed sufficient. From results thus far, I conclude that salt and gypsum introduced into the ground along with the seed, in the foregoing manner, are quite as effective fertilizers as any in this market, and much the cheapest.

Superphosphate retails, in this market, at $60 per ton. Sixty dollars will buy 12 tons of gypsum, or 4½ tons of salt, or 6 tons of the mixture. My farm, the place of these experiments, lies in Seneca County, New York, between Cayuga and Seneca Lakes, about 600 feet above the latter, and 1,100 above tide-water. The soil is a strong clay loam mixed with sand, gravel, and disintegrated rock, known as the Genesee slate group. The primitive forests were very heavy, consisting of white, red, black, and yellow oak; maple, basswood, black walnut, hickory, white ash, elm, and a few other varieties.

A FRUITFUL VARIETY OF BUCKWHEAT.

Jackson County, Iowa.—The silver-hull buckwheat sent here by the Department of Agriculture, has proved to be wonderful—7 pounds of seed yielding 35 bushels of beautiful buckwheat, the weight of which is considerably greater than that of the kind ordinarily sown here.

TEXAS CATTLE-DISEASE.

Appanoose County, Iowa.—In August last, one of our shippers brought in 150 Texas steers and grazed them a few weeks, after which, at the solicitation of parties owning stock in the neighborhood, they were shipped East. The result was that nearly 200 native cattle died on that range before frost.

CORN FOR FUEL.

Nemaha County, Nebraska.—As corn is only 12½ cents per bushel it will not pay for marketing. It is being fed extravagantly, as well as being used for fuel.

AGRICULTURAL CHANGES IN OREGON.

Clackamas County, Oregon.—The luxuriant grasses of former days in Willamette Valley have been eaten out to a very great extent, and stock-raisers are compelled to drive their cattle east of the mountains to find grass sufficient to make the business profitable; many have been driven from this county. A principal reason why hogs have decreased in numbers is the lack of suitable range. In former years we had annually heavy crops of acorns. There was also growing in great abundance, in marshy lands, a kind of root or bulb called by the Indians "camas," (*Camassia esculenta,*) of which hogs were very fond. Cultivation and the hogs have conspired to root out the camas, and the acorn crop has failed for the last fifteen or twenty years; why I cannot tell. Moreover, before steamships and railroads were the order of the day in this country we had no market for our surplus wheat; the best we could do was to turn it into bacon, then haul that to the mines. But now these things have all changed; the oaks bear but few acorns, the camas are about all gone, steamships and railroads carry off our surplus grain, and hog-raising does not pay.

RUSSIAN MINERAL PHOSPHATES.

The following is an original translation of an account of the deposits of phosphate of lime in Central Russia, by Alexis Yermoloff, in the *Journal d'Agriculture Pratique:*

Since the great importance of phosphate of lime has been demonstrated by science and in practice, increased interest has been given to the discovery of beds of this precious material. Hence we have decided to break the silence hitherto kept in regard to the Russian deposits, and beg herewith to lay before the reader a succinct account thereof.

The geologists who explored Central Russia in the first half of the present century remarked the presence of a dark uncrystallized stone, the origin and character of which seemed unknown, and which some of the most eminent, such as Sir R. Murchison, called simply a ferruginous mineral. Around the towns of Koursk and Voroneje these curious deposits were studied with care. Although the stone had been used from time immemorial for building and paving, it was only in 1853 that the first analysis of it was made by Professor Chodnef at St. Petersburg.

This analysis showed the stone in question was composed of phosphate of lime and magnesia joined with the oxides of iron, alumina, and silica. Shortly after, Claus Guillemin, a French engineer, and many other less distinguished chemists made new analyses of this stone, the results of which agreed on the main point of the uniform presence of a large quantity of tribasic phosphate of lime. In 1866, Professor Engelhardt, of St. Petersburg, was invited by the government to explore these deposits, to which public attention had been just called, and determine their extent and richness. From these investigations, in which the writer had the honor to assist, we possess more precise notions of the extent, character, and geologic conditions of the fossil phosphates of Russia, which I am certain will be interesting to your readers.

The rock in question is known in Russia under the name of "samorod," or natural stone. It is most common in the cenomanien beds or formation of greensand, but occurs likewise, though in smaller quantities, in the Jurassic, tertiary, and even in the silurian. In the cretaceous formation the beds are commonly below the white chalk: elsewhere it is discovered above the greensand, containing a quantity of green grains of silicate of protoxide of iron, known under the name of glauconie. In other places nodules of phosphate are found on the surface of the soil, scattered in masses through the arable land. In Middle Russia the cretaceous formation makes a sort of basin, of which only the north side has been explored, and it is precisely where it gives place to the Jurassic and Devonian, that the richest deposits are found.

The extent of country between the Dnieper and the Volga embraced in the principal phosphatic zone is immense, including not less than 20,000,000 of hectares. It is difficult to form an idea of the riches locked up in this deposit, which is however not the only one in Russia. So many other beds have been discovered that we do not believe it an exaggeration to say that Central Russia rests upon enough phosphate of lime to supply Europe, so inexhaustible are the supplies of this article. The western

border of the central bed lies in the southern part of the government of Smolensk, near the railroad from Orel to Riga. From this point the phosphatic beds extend almost without interruption through the governments of Orel, Koursk, Charkoff, and Voroneje, their principal outcrop being not less than 600 kilometers in length, with a breadth of from 100 to 200. South of this zone the bed dips to a depth too great to permit its being worked, but it re-appears on the southern boundary of the cretaceous basin, as is shown by the explorations, still incomplete, which have been pushed in that direction. To the north of Voroneje it disappears entirely, giving place to the lower beds of the formation, but is seen again between Tambof and Spask for more than 200 kilometers, and on the east, on the right bank of the Volga, in the governments of Saratoff and Simbirsk. The country between has not been thoroughly explored, but there is reason to believe that phosphates crop out in several places. Their presence should also be expected south of Voroneje, beneath the white chalk that forms the shores of the Don. Other beds more or less abundant, but little known as yet, are found in Moscow and Nijni Novgorod; also in West Russia near Grodnow.

The scientific researches of Professor Schwakhoefer, of Vienna, have established the existence of phosphate of lime in the silurian schists of Podolia, along the Dniester, where it assumes the shape of great balls; and finally, in the Devonian formation of Novgorod, has been discovered a rock containing not less than 12 per cent. of phosphoric acid. Every day new beds are reported, and all the searches hitherto undertaken have been crowned with success; and doubtless many deposits remain unknown that will be found sooner or later. The condition of the phosphate varies much, as well as the thickness of the beds and their depth beneath the surface, but the chemical composition is pretty uniform. It usually presents itself under the form of nodules similar to those found in the Ardennes, of different sizes, black, brown, gray, green, &c. Sometimes, as in the neighborhood of Koursk, Varoneje, and Tambof, it assumes the form of schists, and is seen in massive blocks that look like cut stone, which are, however, only an agglomeration of large nodules united by a sort of cement; and it is chiefly this form in which the stone is employed for building and paving, the scattered bowlders, which are usually less hard, not having at present any value for such purposes. The number of layers in a bed varies from one to three, in some cases as many as seven, but only one or two are of importance, the rest being merely seams. The thickness of the main layers varies from one-fourth to one-half meter, the nodules being mixed with gray or yellow sand. Sometimes it is on the surface of the fields, and sometimes several hundred feet below. It is everywhere remarked that on the outside of the region of phosphates the beds crop out, but in the middle they lie deep.

Our knowledge of its chemical composition is tolerably precise, thanks to the large number of analyses which have been made of it, the results of which exhibit remarkable uniformity, and establish the mean of phosphoric acid at about 20 per cent., varying from 12 to 33; while the proportion of lime rises from 18 to 50, and carbonic acid from 2 to 6 per cent., together with an irregular mixture of sand, clay, and organic matter not affected by the acids. The following table will give some idea of the different samples, and illustrate their richness:

No. I is the debris of a block of the phosphate from the environs of Koursk, (analysis by Professor Claus.)

No. II, nodules from Spask, (by the writer.)

No. III, the same, (by the writer.)

No. IV, debris of a block from one of the richest beds of the government of Tambof, (by the author.)

No. V, fossil-bone from the same bed, analyzed by the students of the agricultural institute at St. Petersburg.

No. VI, fossil-wood found in the neighborhood of Spask, in the beds of phosphate, (analysis by Professor Engelhardt.)

No. VII, nodules and organic debris from the beds of the government of Orel, (analysis by students of the institute.)

No. VIII, for comparison, analysis of a nodule from the Ardennes, near Deherain.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Sand and clay	50.00	9.50	59.70	35.50	1.45	0	7.10	33.40
Phosphoric acid	13.60	27.48	12.63	20.26	31.76	35.23	29.84	20.80
Carbonic acid	3.45	3.95	1.98	.....	.....	3.44	6.06	.....
Sulphuric acid	0.86	1.08	0.44	0.85	.....	.....	1.39	.....
Lime	21.00	42.00	18.54	29.07	48.53	51.90	47.99	22.50
Magnesia	0.65	0.40	.....	.....	1.48	.....	0.47	3.00
Oxide of alumina and iron	2.20	3.19	.....	3.47	0.32	1.15	0.89	3.80

It is estimated that the beds of the central zone—that is to say, near Smolensk, Orel, Koursk, and Varoneje, contain not less than 44,000 tons to the hectare, while those of the government of Tambof, which I consider the richest, will furnish from 50,000 to

70,000 tons to the hectare. Admitting the ton only contains 150 kilograms of phosphoric acid, this calculation will give us a mean of 15,000 to 20,000 tons of phosphate of lime per hectare, and this is based upon the contents of the principal beds only, without counting the thinner seams. I would not tell the whole truth, for fear I might be accused of exaggeration.

The localities in the neighborhood of the towns of Roslawl, (government of Smolensk,) and of Briansk, (government of Orel,) present the most favorable conditions to obtain the phosphates which there appear on the surface; but the beds of the eastern zone, and of Spask-Tombof, are the richest and most abundant, while the central zone, extending from Koursk to Varoneje, represents a medium between the other two formations.

All these regions are traversed by railways, of which the most important are the lines of Charkof-Koursk-Orel-Moscow: of Voroneje-Moscow, and Voroneje to the sea of Azof; of Saratoff-Tambof-Kosloff-Moscow; and that of Volga-Griaze-Orel-Smolensk-Riga, to the frontier.

Notwithstanding the enormous distances, transportation does not present much difficulty, especially if those beds are worked which lie nearest the sea-ports, such as those recently found in Podolia and the government of Grodno, of which we possess specimens sufficient to establish their value, though they have not yet been closely examined.

These great deposits were hardly discovered when their development commenced. At present there are three establishments, two in the government of Koursk, and one at Riga. This last receives the raw material from Smolensk, reduces it to powder, and in spite of the high price it charges (viz, 9 francs per 100 kilograms) sells a considerable quantity to the proprietors in the Baltic provinces. The factories in Koursk have received government aid to the extent of 40,000 francs, but owing to want of skill and credit one of them is already in process of liquidation; the other, which commenced about a year ago, has been managed to much better advantage, although it charges too much for its products, viz, 5 francs per 100 kilograms, bagged and delivered at the factory. The quality of the article is excellent, and if means can be found to reduce the price, not only will the sale be much more rapid, but the profits greater, as the phosphatic rock costs only about from 3 to 6 francs the ton at the quarry.

It only remains to add, that notwithstanding the value of our phosphates, and the importance of manure to the Russian farms, impoverished by exhausting culture, our agriculture has scarcely begun to profit by them. Our rural inhabitants are slow to adopt mineral manures, accustomed as they have been for ages to the use of farm-yard dung alone, which has now become too scarce and costly to re-establish the wasted fertility of our soil. Fortunately we possess sufficient phosphate to supply, not merely our own farmers, but all Europe besides, for an indefinite period.

GRAPE-CULTURE AND WINE-MAKING IN EL PASO DEL NORTE.

The Department of Agriculture has received, through the Department of State, the following communication from William M. Pierson, esq., United States vice-consul at El Paso del Norte, Mexico, describing the primitive method of manufacturing wine in that consular district:

UNITED STATES CONSULATE, PASO DEL NORTE,
Mexico, November 30, 1872.

Referring to my dispatches of 15th and 26th instant, I have the honor to report that vineyards in this valley three years old produce a small quantity of grapes; the fourth year almost a half wine-crop is produced; the fifth year brings three-fourths of a crop, while the sixth year is the attainment of full development, and a full wine-crop is realized.

The common wine-yield of a healthy vineyard is two hundred and fifty gallons to the acre. The wine is manufactured in the most simple and primitive manner. It is the pure juice of the grape, receiving no doctoring or scientific manipulation. The manufacturer first provides himself with a sufficient quantity of raw-hide sacks, formed by fastening the outer edge of a large green hide to a square frame made of round poles, the hide hanging down in a sack form, or apparently much like the hang-down bird's nest of the North. The sack is then allowed to dry in the sun, when it acquires an iron-like solidity. Having acquired these sacks, a set of tramping-pans are also made from

green hide by drawing the piece of hide over a square box just the size to fit in the mouth of the main sack. The outer edge of the hide, after drawing it over the box, is lashed to a square frame made of round poles. It is dried in the sun, and also attains an iron-like hardness. This tramping-pan is about 8 inches deep, and, when dry, is taken off from the box upon which it is formed, and the bottom perforated with holes to allow the juice to escape, when tramped, into the main sack below.

Forked poles are now set in the ground-floor of the wine-house, and long poles placed in the forks, which are set at proper distances from each other. The main wine-sack is suspended upon these poles, and the tramping-pan placed in the mouth of the wine-sack. The tramping-pan is now filled with grapes, and a stalwart Mexican performs the office of wine-pressing by virtue of vigorous tramps from a pair of remarkably brawny feet. The accompanying drawing will illustrate the method of wine-pressing described above

The wine, when fresh from the press, is poured into barrels, and remains ten days for hot fermentation, and is then drawn off. It now remains sixty days, when it is drawn off again in a cool state, and thirty days from the second drawing it is ready for use.

The compensation of this consulate is not sufficient to justify the employment of an artist. I have, therefore, executed the drawing representing the mode of wine-pressing in this valley myself, and, though inartistically done, nevertheless it will, in a manner, illustrate what I have written regarding what I know about wine-pressing (not farming) in this consular district.

I am, sir, your obedient servant,

WILLIAM M. PIERSON,
United States Vice-Consul.

SUGAR-MAKING IN THE FRENCH WEST INDIES.

A system of central factories has been adopted within a few years, in the French West India islands of Martinique and Guadalupe, for the manufacture of sugar. This system is a substitute for the long-practiced method of making the sugar by individuals upon the plantations where the cane is produced. The design is to separate agriculture from manufacture, and by a concentration of capital, somewhat upon the co operative system, to accomplish what the isolated planter was unable to do. The experiment, made upon a large scale during a series of years, it is maintained, has fully demonstrated the soundness of the principle. The cen-

tral factories, or *usines*, as they are called, are owned by joint-stock companies, by which the sugar-cane is taken from the plantation and transported to the mill upon railroads, or tram-ways, constructed by those companies, a certain per cent. of the value of the cane being allowed the planter, the price being regulated by the market at Point-à-Pitre at the time the cane is delivered. The system seems to have proved a success, affording to the manufacturing interest a handsome profit, and, by leaving the planter free to devote himself to his peculiar vocation, largely increasing the cultivation of cane.

The government of the island of Jamaica recently appointed a commission to visit the French islands, and inquire into the working of this central sugar-factory system. The Department of Agriculture has received, through the Department of State, the report of these commissioners. Their examinations were made during the last summer, and the results, as stated by them, are not without interest and value to the sugar-producers of the United States.

The largest central factory in the French islands is that which is commonly called the "Usine d'Arboussier," at Point-à-Pitre, (Saint Louis,) the chief commercial station of the island. The factory is in the suburbs of this sea-port, and is constructed upon the grandest scale, having all the improvements in machinery and the manufacture of sugar devised by modern science. The cost of it was upward of a million of dollars, and its capacity of manufacture is equal to 10,000 tons of sugar during the first six months of the year, which is the manufacturing season. The process of manufacture, as described by the commissioners, is as follows:

The canes are brought by the planter to a siding of the main tram-way on his estate. The wagon generally carries two tons of canes, and one mule on a good level ordinary tram-way can draw easily two wagons. The wagon, when brought to the mill itself, conveys the canes to the rollers. The bagasse being elevated by power to a platform over the boilers, the juice, on leaving the mill-bed, falls through three strainers into a tank, which has a double bottom, heated by steam. It is treated here with a little bi-sulphite of lime, and is then run into a montejus. This montejus, by steam, sends the juice up to the clarifiers, where it is heated in the ordinary way and tempered with lime properly. From this it is passed to the charcoal-filters, through which it gravitates, and then passes by a gutter into a receiver. From this it is passed to a montejus and is thrown up by steam into a cistern over the triple-effet. From this cistern it gravitates into the triple-effet, passing from the first to the second, and from the second to the third boiler, as the attendant wishes. When it leaves the boiler it is immediately passed over new reburned charcoal. It gravitates through this and falls into another receiver from which the vacum-pan takes it up and boils it to sugar. The first-quality sugar is generally crystalized in the pan, and is then dropped into sugar-boxes which stand seven feet from the ground; under these boxes a little charging-vessel runs on a railway that is hung from the bottom of the said boxes, and this vessel conveys the sugar over the centrifugals, where it is cured; the molasses from this being boiled up, when found in good condition, with the sirup of the following day. When this molasses is thick and clammy it is boiled into a jelly by itself and dropped into sugar-boxes, where it is allowed to granulate for a number of days. This makes the second-quality sugar, and the molasses from this, along with the skimmings and subsidings of clarifiers, goes to make rum. The juice that leaves the clarifiers does not pass over fresh charcoal, but follows the sirup from the triple-effet, thus assisting to wash out the sweets which may have been left by the sirup.

The weight of canes delivered at the factory last year was 75,000 tons, although it was a season of drought. The factory can receive 100,000 tons a year. Last year 5,325 tons of sugar were obtained from 68,745 tons of cane, or about 7¾ per cent. In April last the factory company declared a first dividend of 24 per cent. In other words, a net profit of $181,585 was made upon the manufacture of 68,745 tons of sugar, and 182,798 gallons of rum.

The processes of manufacture in all the factories, both in Guadalupe and Martinique, are identical, the only difference being the adoption in the new factories of the appliances of modern science, and improved mechanical and other arrangements. The clarification of the juice, its reduction to sirup at a low temperature, the perfect crystallization and color of the sugar, and a maximum return, are obtained by repeated filtration through animal charcoal, the "triple-effet" and vacuum-pan processes, and, last

of all, centrifugal machines. In Martinique the mean weight of canes was found to be equal to 28 tons per acre, producing, say, 2¼ tons of sugar, and the sugar sells at $200 a ton.

The central factories, or usines, are represented as in the highest popular favor. Capital, both local and in France, is freely subscribed to establish new usines upon a large and extensive scale. Eight of the factories, at considerable cost, have been erected within the last two years, and others are now in process of erection. They seem everywhere, by increasing the facilities of manufacture, to have stimulated the planters to increased production of the cane. In speaking of the difference between the tillage of those who sell their canes to the usines and those who manufacture at home, it is remarked that in the one case the canes are no sooner out of the fields than the gangs and stock are at work preparing the land for the next crop, and all the fields are tidy and clean. In the other case fields are left to take care of themselves until the crop season is over. Estates which, before the establishment of the usines, were in debt, are now said to be in a flourishing condition, and others which had almost fallen out of cultivation are now making excellent crops.

In most of the factories hydraulic or other presses are employed for extracting the remnants of juice from the skimmings. The former are carefully returned to the clarifiers, the residuum being a hard cake, which is used for fodder and manure.

SYSTEMATIC CROP REPORTS.

One of our regular correspondents, (Mr. R. V. Montague,) representing the county of Ralls, in Missouri, writes with some warmth relative to our system of crop reports as follows:

For the past few months I have noticed, in some of the leading journals of the day, rather severe strictures passed upon the management of the Agricultural Department. I think all such imputations to be unjust. Under existing circumstances, I think the plan devised by the Department to obtain information, relative to the crops throughout this vast scope of country, is as near perfect as can be devised. Your correspondents have no incentives to make false reports; and both honesty and pride will prompt them to be correct. I infer that you select your correspondents, as a general thing, from the farming community. It is unjust, as well as absurd, for editors of newspapers to assert that a farmer is not capable of making a just estimate of the crops in his locality. If they are incapable of doing so, the Government ought to abolish the Agricultural Department and use the funds to establish an insane asylum for them. However, concede them capable, are they honest; and will they make honest and prompt returns of the condition of the crops? I assert, without fear of successful contradiction, that they are as honest and prompt as any other class of men. Then, if they are capable and honest, why not intrust to them the execution of the regular monthly returns of the Department?

I notice that many members of the press stigmatize your correspondents as the "favored few." Favored! I would like to know in what respect? Do they call the courtesy of sending them a few packages of seed or printed reports "favors?" Are such favors commensurate with the efforts which a farmer makes to send in a correct statement of the condition of the crops twelve times during the year? Will the press engage to furnish agents who will do it any cheaper and as accurately? I know whereof I speak. I am one of the correspondents of the Department, and, without desiring to make a pompous display of what we do, permit me to mention that we do not rely solely upon our own judgment, nor upon the opinions of assistants, in making up our reports. Every month I seek the advice and counsel of men whom I know to be excellent farmers. I do so almost to the prejudice of my own farm affairs. *A fortiori*, if I am thus particular, is it not reasonable to presume that others in similar positions will be equally accurate and energetic? Pray tell me, if we who live, move, and have our very being in the midst of our crops are not to be relied upon, then who are? As an illustrative example, Mr. Geddes, of New York, has been indicated by some members of the press. Very well, Mr. G. is a man erudite in all things pertaining to a farm, but he is a farmer, after all. Is it possible to employ twenty such men in every State to act as reporters to the Department? Is it necessary to employ such men? True, the Department would be more than rejoiced to secure the services of such undoubted ability.* Yet this does not argue against the competency of other men to fill the position.

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* He is a fair representative of the class of men sought as crop reporters—men high in the rural organizations of their respective States, and in the confidence of their fellow farmers, as men of accurate judgment and large agricultural experience.—(Ed. Rep.)

If the press would strive to assist the Department, rather than subvert its efforts, it would redound to the benefit of both farmers and the country. If it wishes to extend its advice to the Department, it should assume a less dictatorial attitude.

The following extract from a letter of Mr. E. Longuemare, secretary of the Perry County, Indiana, Agricultural association, but not a statistical correspondent, gives an illustration of the money value of reliable information:

We have observed the expressions of dissatisfaction, made from a certain quarter, regarding the system of crop reports as adopted by the Department. We desire to offer our protest against the attack made on the system as carried out by the United States Department of Agriculture. We know from experience its worth and its correctness. We do not aver that the system has reached a state of perfect completeness, but we do maintain that it is not only of incalculable advantage to the agricultural districts, but we hold it to be a necessity. I could give you many proofs of this did I think it necessary to the Department. I will only mention the material advantage it proved to us this year in one particular only. About the time of the potato harvest this fall our producers were all astray respecting the market value of the potato crop, (one of our main crops in this section.) This uncertainty was taken advantage of by buyers, and they swarmed down on our producers early in the day, offering 50 cents per bushel. Some producers accepted the offer, but the vast proportion of our farmers concluded, at the request of the association, to await the report from the Agricultural Department. It reached us in proper time, and a careful analysis was made of its reports of the potato crop. Our people acted upon it, and the result was a gain of many thousands to our people. The speculator found fault with the Department, but the farmer was more than ever convinced that in one respect at least the people were well served. So far as we can understand the system as proposed by Maury, we do not believe it to be of any practical benefit to agriculture; at all events we are averse to a change; we hope and believe the system of the Department will grow to a greater degree of perfection, though it can hardly be more correct.

AGRICULTURAL IMPORTS.

The principal agricultural imports of the last fiscal year, from June 30, 1871, to June 30, 1872, as compiled in the Bureau of Statistics, are as follows:

Articles.	Quantities.		Value.	
	1872.	1871.	1872.	1871.
Living animals of all kinds	.....	.....	$3,465,554	$5,845,926
Breadstuffs and other farinaceous food:				
Barley.....bushels..	5,565,591	4,866,700	3,403,607	3,678,810
Barley-malt.....do....	233,941	.....	186,351	.....
Bread and biscuit.....pounds..	955,083	1,265,371	111,545	142,313
Indian corn.....bushels..	58,568	111,080	74,434	105,678
Oats.....do....	525,250	599,514	194,198	246,155
Rice.....pounds..	74,642,631	64,655,827	2,317,172	1,876,786
Rye.....bushels..	249,146	116,073	179,910	84,418
Wheat.....do....	1,546,623	717,179	2,188,689	933,253
Wheat flour.....barrels..	172,823	30,062	1,028,142	163,650
Meal or flour made from oats, Indian corn, rye, and buckwheat.....	.....	.....	205,604	277
Peas, beans, and other seeds of leguminous plants.....bushels..	365,977	.....	325,743	.....
Cotton and manufactures of:				
Bleached and unbleached.....square yards..	41,700,373	36,938,026	5,316,877	4,883,622
Printed, painted, or colored.....do....	36,578,465	28,975,876	4,975,624	3,634,315
Hosiery, shirts and drawers.....	.....	.....	5,451,523	5,085,993
Jeans, denims, drillings, &c ...square yards..	6,483,461	5,386,146	878,580	737,251
Other manufactures of.....	.....	.....	18,684,843	15,535,459
Flax and manufactures of:				
Raw flax.....tons..	5,274	3,672	1,399,747	694,832
Manufactures of, by yards.....	.....	.....	16,615,066	13,560,702
Other manufactures of.....	.....	.....	4,605,430	4,500,393
Fruits of all kinds, including nuts	.....	.....	10,383,466	9,602,630

Articles.	Quantities.		Value.	
	1872.	1871.	1872.	1871.
Hemp, and manufactures of:				
Raw.....tons..	27,613	20,805	$4,580,049	$3,918 129
Manufactures of, by yard.....square yards..	526,793	931,658	90,850	135,823
Other manufactures of, not elsewhere specified	.....	.....	366,891	287,596
Hides and skins, other than furs	.....	.....	12,973,904	14,892,987
Jute and other fibers except hemp:				
Raw.....tons..	41,351	26,450	2,666,479	2,131 056
Manufactures of, by yard.....square yards..	185,357	228,873	24,260	28,556
Gunny-cloth, and manufactures of, used for bagging.....pounds..	12,137,603	30,124,466	505,566	1,468,902
Other manufactures of	.....	.....	1,292,515	1,734,474
Oils:				
Coal and other mineral oils.....gallons..	2,967,327	.....	505,591	.....
Whale and fish, not of American fisheries.....gallons..	290,222	354,188	151,567	201,254
All other animal.....do...	615	.....	456	.....
Olive, salad.....do...	196,364	142,243	349,535	252,667
Olive, not salad.....do...	108,650	147,075	87,795	123,321
All other vegetable, fixed.....do...	390,482	4,033,516	212,365	1,247,661
Volatile or essential .....pounds..	379,417	322,789	673,889	527,498
Opium and extract of.....do...	416,864	315,121	2,107,341	1,926,915
Paper:				
Paper-stock .....pounds..	192	.....	16	.....
Printing-paper .....do...	4,343,820	2,632,324	350,246	218,833
Writing-paper.....do...	.....	.....	222,029	27,784
Potatoes.....bushels..	96,259	458,758	95,308	234,303
Provisions:				
Meat, poultry, lard, butter, cheese, &c	.....	.....	3,386,979	3,650,487
Salt .....pounds..	617,804,664	637,752,646	1,214,747	1,254,001
Spices, (except vanilla beans:)				
Ginger, pepper, and mustard.....pounds..	22,186,673	23,393,398	2,722,610	2,165,557
Sugar and molasses:				
Brown sugar.....pounds..	1,457,294,818	1,189,155,938	79,129,059	61,249,621
Refined sugar.....do...	217,481	1,204,180	17,915	74,741
Molasses.....gallons..	45,214,403	44,401,359	10,627,511	10,192,384
Melada and sirup of sugar-cane ....pounds..	51,673,375	87,113,535	2,066,027	3,296,877
Candy and confectionery ....do...	63,833	50,546	18,758	13,225
Tobacco:				
Leaf.....pounds..	9,562,398	8,394,980	4,326,142	3,433,669
Cigars.....do....	880,649	789,962	2,838,444	2,550,670
Other manufactures of	.....	.....	165,336	62,946
Wood, and manufactures of:				
Cabinet-ware furniture	.....	.....	1,510,994	1,149,389
Boards, deals, planks, joists, and scantling.....M feet..	714,811	725,994	7,132,061	6,863,684
Shingles.....M..	102,904	.....	209,503	225,232
Other lumber	.....	.....	270,085	404,059
Timber, sawed or hewn, wholly or in part	.....	.....	155,022	226,570
Rough timber and unmanufactured wood	.....	.....	168,539	193,495
Firewood	.....	.....	201,055	216,613
Wool, sheep's, and hair of alpaca, goat, &c.:				
Unmanufactured .....pounds..	122,256,499	68,058,028	26,214,195	9,780,443
Skins of sheep and Angora goats, unmanufactured, with wool or hair on	.....	.....	991,878	.....
Cloths and cassimeres	.....	.....	14,159,774	10,902,761
Woolen rags, shoddy, mungo, waste, and flocks.....pounds..	2,719,246	1,277,495	232,211	87,667
Shawls	.....	.....	3,424,349	2,160,037
Blankets	.....	.....	38,785	28,050
Carpets.....square yards..	5,072,247	4,775,705	5,727,183	4,691,061
Dress-goods .....do....	72,079,900	75,361,713	20,439,481	18,586,874
Hosiery, shirts, and drawers	.....	.....	658,193	538,770
Other manufactures	.....	.....	7,728,495	6,844,420

ENTOMOLOGICAL RECORD.

By Townend Glover, Entomologist.

The apple-twig borer.—Numbers of letters have been received by the Department from the Western and Southwestern States during the past season complaining of the injury done to fruit-trees by a small insect, which bores into the wood and frequently destroys the branch

or twig attacked. For some time the injured branches only were sent, but at last Mr. William Duane Wilson, of the Iowa Homestead, forwarded some branches of the grape-vine, with the insects in them, and on examination they proved to be the apple-twig borer, *Amphicerus* (*Bostrichus*) *bicaudatus*, of Leconte. These insects measure from .25 to .35 of an inch in length, and are small, dark chestnut-colored beetles, of a cylindrical form, having the front part of the thorax roughened with elevated points, the male having two little horns, and the tips of the wing-covers above, provided with two prickle-like points curving inward. In his letter Mr. Wilson complains much of the injury done by these insects in Iowa, and says that seven to nine year old vines are killed from the root up, and that out of fourteen vines, eleven were killed. Mr. Allen Crocker, of Burlington, Kansas, some time ago stated that in Kansas this insect did much damage by boring into the twigs of the white hickory. Other correspondents say that it also attacks apple, pear, and cherry trees in a similar manner, by boring into the twigs and young branches. It is in the perfect or beetle state that the insect does the injury to our fruit and forest trees, boring into the twig just above a bud, working downward sometimes to the depth of two or more inches through the pith, thus finding in the branch both food and protection. Even in midwinter both male and female beetles may sometimes be found hiding in their cylindrical burrows, and always with the head directed downward. The insects are plentiful in the Western States, and, although they have been taken in Maryland and Pennsylvania, we have received no accounts of their ravages from eastern correspondents. The only remedy that can be suggested, when the insect attacks twigs and branches, is to cut them off some distance below the place injured and to burn them immediately, with the beetles inside, as it is not likely that any preparation could be applied to the trees that would prevent their attacks.

THE ARMY OR SNAKE-WORM AGAIN.—In regard to this singular worm, a description of which was given in the monthly report for October, 1872, Mr. M. H. Spera writes from Ephratah, Pennsylvania, as follows: "During the past summer I found several of these 'snakes,' one of them, when found, measuring eighteen inches in length, and numbering 497 worms, some being .30 of an inch in length. It was moving rapidly. Several days after I found another, not as large as the former, containing 364 worms. Of these I secured a number, placing them in a glass box, in which I also placed damp earth and moss. When I placed them in the box, about 3 p. m., they would crawl on the glass, but by next morning they had all disappeared beneath the earth and moss. The perfect flies appeared on the afternoon of the fifth day, and on the sixth and seventh, their description perfectly agreeing with that given in the monthly report. The first was found on the 27th of July, the second several days after."

THE ROSE-BUG.—Mr. Charles B. Thompson, of Elwood, New Jersey, writes to the Department that after having made many inquiries as to the means of extirpating the rose-bug, and tried many reputed remedies without success, he at length accomplished his object by the use of dry, unleached oak-ashes. He scattered the ashes upon the vines and the branches of peach and apple trees that were infested by the bug early in the morning, while the dew was on the leaves. The result was that within four days after this application the bugs had almost entirely disappeared.

Mr. George Hardy, of Avola, Vernon County, Missouri, has made a similar experiment with the same favorable result. He writes to the

Department that to prevent the bugs from injuring his vines he scattered oak-ashes (unleached) on them, while the dew was on, and with such success that a second application was unnecessary.

INSECTS INJURIOUS TO PLUMS.—Mr. William R. Marine, of Greencastle, Missouri, writes to the Department that he has discovered a remedy for the ravages of insects or bugs upon plum-trees. He says: "I have been successful in the use of road-dust and sulphur. To one bushel of road-dust I add five pounds of sulphur, and commence the use of this mixture about the time the petals fall off, dashing in handfuls among the young plums, morning and evening, two or three times a week, for the space of six weeks, or until the plums have attained to a sufficient growth for resistance to the operations of the bug."

CHEMICAL MEMORANDA.

BY WILLIAM MCMURTRIE, ACTING CHEMIST.

MINERAL FERTILIZER.—During the month of December last a package of mineral fertilizer was sent to this Department for analysis, by Mr. James K. Gibson, of Abingdon, Virginia, who states that he used it during the past season upon his corn-crop, and until the beginning of the dry weather it produced a very fine effect. The substance submitted to analysis in the laboratory of the Department shows the following composition:

Moisture, (at 100° C.)	0.100
Silica	34.655
Peroxides of iron and alumina	14.542
Phosphoric acid	0.563
Lime	22.207
Magnesia	9.614
Carbonic acid	17.448
Alkalies	Traces.
Loss	0.871
	100.000

Owing to the absence of notable quantities of phosphoric acid and potash, its value is evidently due to the amount of lime and magnesia which it contains.

THE MESQUITE.—It seems that the mesquite-tree of the Southwestern States, in addition to the many other uses to which it has been applied, such as that of a food and gum producing material, has another valuable property which may bring it into greater popularity and more frequent use in the arts. It has for some time been considered by the inhabitants of Western Texas a valuable tanning material. Dr. J. Park, of Seguin, Texas, made some investigations with regard to its value in this respect, and found that the whole body of the tree was rich in tannin, and considered the leather produced with it of better quality than that tanned with oak-bark. It is stated that it is very abundant throughout Texas, Arizona, and Mexico, and may be cheaply reduced to a form convenient for tanning purposes. With a view to a determination of its value in this respect some shavings of this kind of wood were sent to this Department for analysis by Mr. Daniel Ruggles, of Fredericksburgh, Virginia. The following results were obtained:

Tannin	13 per cent.
Woody fiber, &c.	87 per cent.
	100 per cent.

It will be seen that this, when compared with other tanning materials, is certainly a very valuable product. According to E. Wolff different oak-barks, of trees from five to fifty years old, yield from 10.86 to 15.83 per cent. of tannin, the lower results having been obtained from an examination of the crude bark of old trees, while the higher results were obtained from examination of the inner bark of young trees. Büchner, in his researches in 1867, determined that the best kinds of oak-bark contained but 6 to 7 per cent. of tannic acid. The bark of the hemlock, (*Abies canadensis.*) so much used throughout the United States, contains, according to J. Feser, from 5 to 15 per cent. of tannin, while Dr. Wagner finds but 7.3 per cent. It will be seen that the amount of tannin contained in the mesquite-wood is higher than that of many other tanning materials, and thus when compared with them this product is as valuable as any other material used in this branch of industry.

USE OF SULPHUROUS ACID IN MANUFACTURE OF ALCOHOL.—The increased yield of alcohol, obtainable from different kinds of grain, by the use of sulphurous acid, has led to its very general use in many parts of Europe. From the investigations of Hemilian and Melnikoff it would seem that the weak solution of sulphurous acid used dissolves the gluten and other albuminoid substances, thus allowing the starch to come into more perfect contact with the solution of diastase. It has, therefore, two different actions, the one being the partial destruction of the fermenting power of the diastase, while the other promotes the inversion of the starch. It was determined that the largest quantity of glucose is obtained when the cold maceration is continued five or six hours with a solution containing an amount of sulphurous acid equal to 0.1 to 0.13 per cent., the quantity of malt and meal used. If, however, the maceration be continued for eighteen hours, with cold water alone, the effect is the same as when the sulphurous acid is used, except that we have acidification and incipient putrefaction. The use of sulphurous acid in the most favorable conditions is found to increase the yield of glucose from 2 to 3 per cent. of the weight of the grain employed. The method of using it, as suggested by Hemilian and Melnikoff, is as follows: The meal only, without the malt, is macerated in the cold with the solution of sulphurous acid, of the strength above mentioned, and then heated to 50° C., so as to volatilize any free sulphurous acid. The malt is then added, and the mixture, being all the time well stirred, is heated from 70° to 75°, these temperatures being best suited to the saccharification. The principal utility of sulphurous acid is due to its power to prevent the formation of free acids, which are always generated at the expense of the alcohol, while the decrease of free acids in the spent wash renders it more valuable as food for cattle, since its nutritive value is thus increased and it is less injurious to health.

SULPHUROUS OXIDE ON VEGETATION.—It has been observed that trees in the neighborhood of smelting-works are injured by the fumes of sulphurous oxide proceeding from them, and that the *Coniferæ* suffer greater injury than ordinary foliaged trees. The fumes are absorbed through leaves entirely, not by the stomata alone, but by the whole surface of the leaves. It could have no influence upon the plants through the soil, since the sulphurous oxide would be oxidized and sul-

phuric acid be formed, which, in the small quantity in which it would exist, could have no injurious influence, but rather beneficial. The amount of injury is also influenced by the condition and temperature of the atmosphere. If the air be dry and cold, the injury is much less than when a warm, moist condition prevails, accompanied with strong light, such as exists in the summer seasons.

INDIGO-CARMINE IN SUGAR MANUFACTURE.—Indigo-carmine easily dissolves in water, furnishing a clear blue solution. For the preparation of this solution in practice, one pound of indigo-carmine is dissolved in ten pounds of water, the water being added little by little, with constant stirring, in order to dissolve it uniformly and produce the clear blue liquid required. This solution is poured into the material to be cleared, until the whole acquires a light-blue color. Determined proportions cannot be given, since some manufacturers make their sugar more blue than others, and this also depends partly upon the quality of the material. Besides, it is quite easy to determine the correct proportions by a little practice. The use of this solution is much preferable to ultramarine, since the sugar treated with it shows an extremely brilliant luster, and appears dazzling white.

LIQUID GLUE.—C. Puscher, in *Polytechnisches Notizblatt*, states that a mixture of one part grape-sugar in three parts water, when spread upon paper, shows little adhesive power or brilliancy, and when dried, and subsequently moistened, will not stick to the fingers. But if to the sugar solution be added an amount of slaked lime equal to one-fourth that of the sugar present, and the whole be heated to 60° to 75° C., (140° to 170° F.) and allowed to stand for several days with occasional shaking, the greater part of the lime will be dissolved, and the mixture will act like gum, having all its glistening and adhesive properties. If to the sugar solution thus prepared three parts of glue be added in small pieces, it quickly dissolves on being warmed, and the whole remains fluid on cooling without losing its adhesive properties.

LAURUS A FEBRIFUGE.—The great success which has attended the use of the leaves of *Laurus nobilis* in cases of intermittent fevers, on account of their febrifugic and antiperiodic properties, will probably bring them into general use in medical practice. The leaves are dried at a low temperature (in a closed vessel, to avoid loss of volatile matters) until they become brittle. They are then reduced to a fine powder and 15 to 16 grains of this powder is then macerated from ten to twelve hours in a glass of cold water, and about two hours before the attack is expected the liquid and the powder are administered. No abnormal effect is produced, and the attack does not appear after the administration of the first mass. No particular treatment or diet is necessary during the good days. This medicine is thus administered during the three following days. This treatment has proved effectual in cases of quotidian and tertian fevers, which have rebelled against the action of sulphate of quinine, and it is probable that if administered in the same manner in cases of quartan fevers it would produce the same effect. Of 34 cases reported in which it was used, only six failed, and these were all related to quartan fevers.

EUCALYPTUS GLOBULUS.—From the results of certain investigations upon the leaves and bark of *Eucalyptus globulus* used in cases of intermittent fevers, M. Rabuteau maintains that the leaves do not contain an alkaloid similar to quinine, as has been stated, and that the substance successfully used by the physicians of Corse is an undetermined saline residue obtained by treating an alcoholic extract of the bark with sulphuric acid.

BOTANICAL NOTES.

By Dr. George Vasey, Botanist.

Branching palms.—In the Agricultural Gazette of India for September, 1872, we notice an interesting account of some singular deviations from the general law of growth which governs the development of *endogenous* trees. Trees of the temperate zone are almost entirely of the *exogenous* structure, *i. e.*, they ramify during many years, and increase in diameter by the annual addition of a layer of woody matter external to the preceding ones. In palms, however, the growth is different; the stem shoots up in one unbroken column, sometimes to an immense height, and at the top develops a mass of leaves and sends up its flower-spikes, upon which is produced the fruit.

Such trees rarely or never produce branches, but the article quoted below gives interesting details of some of the rare exceptional cases. The notes were communicated to the Agricultural and Horticultural Society of India:

I have much pleasure in communicating to the society the following notes by Dr. Beaumont, descriptive of a unique example of fasciation and branching in a date-palm, (*Phœnix sylvestris*,) with a very instructive sketch of the same by Mr. Daly, in whose garden the palm grows. This is a remarkably good sketch of a common date-palm in the residency garden, Indore. The trunk is 22 feet high to the lowest branch and 3 feet 6 inches in girth at 4 feet from the ground. The branches are twenty-two in number; eighteen of them rise vertically, and are so closely packed that it was not possible to give a clearer idea of them in the picture. I have examined the tree and determined that it is really branched, and that the branched appearance is not owing to seeds having germinated in the axils of the leaf-stalks.

I take this opportunity also of noting a few cases of palms which have produced branches near Calcutta, and for the knowledge of which I am chiefly indebted to the native overseer of this garden, Babu P. G. Sein.

1. *Phœnix sylvestris.*—A large specimen of this palm, near Ooleobariah, had a tall erect stem, branching irregularly at a considerable height into seven distinct and well-developed heads. This specimen was uprooted and destroyed by the cyclone of 1864. A second specimen of this palm at Sookhchur, near Barrackpore, of a smaller size, had also six lateral branches overtopped with the main crown. This specimen seems also to have been uprooted by the cyclone. I have accounts of other less numerously branched specimens, but I can hear of none of this palm now existing in the vicinity of Calcutta.

2. *Cocos nucifera*, (the cocoa-nut tree.)—A most interesting example of branching in this palm was illustrated by a large specimen in the garden of Babu Luckinarain Dutt. This tree was about 25 feet in height, and had five well-developed fruit-bearing heads. It was held in great veneration by the Hindoos, and annually in June, about the time of the Moonsha Poojah, flowers, fruit, rice, &c., were scattered around its roots by the many Hindoos who visited it. The late Dr. Falconer tried in vain to purchase the specimen, and I hear that he sent a native from this garden to measure it carefully, but he does not appear to have anywhere recorded these. As in the case of the date-palms, this specimen was also broken and uprooted by the cyclone of 1864. I have just heard that a two-headed cocoa-nut palm may be seen in the garden of Ghosal Babu, at a short distance from the Conaghur Station, on the East India Railway.

Potentilla fruticosa, again.—We gave in last month's report a letter from Mr. T. S. Gold, objecting to the cultivation of the shrubby cinquefoil, in apprehension of its becoming a nuisance by spreading, through the dispersion of the seeds. We had been acquainted with the shrub for many years, and had never known of its disposition to spread unduly, and it has been in cultivation in the grounds of the Department here for many years without showing any such tendency. Mr. H. C. Beardslee, of Painesville, Ohio, has written to the Department concerning this shrub, and says:

I have collected botanical specimens of the plant in Connecticut, Massachusetts, Rhode Island, New Hampshire, New York, Pennsylvania, Michigan, and Canada, and more recently in Northern Ohio. I have met with it often in the more northern regions, and never in any locality sufficiently abundant to prove troublesome. Nor have I

anywhere heard it called "hardhack." That name, I suppose, belongs everywhere to *Spirea tomentosa, L.* This last abounds in the wet and stony pastures of New England, especially of Northern New England. But, where most abundant, it, the hardhack, is far from being a nuisance. The leaves and young shoots are rich in tannin, and once in three years the plant is mowed, cured, and sold to the tanners, at prices which afford a fair profit for the use of the land. An intelligent and successful farmer in Middle New Hampshire informed me that the discovery that hardhack could be so utilized had increased the value of their low and wet lands. Both the *Potentilla fruticosa* and the hardhack (*Spirea tomentosa*) are pretty shrubs.

FACTS FROM VARIOUS SOURCES.

RAILROAD FREIGHTS.—The burden of railroad freights is a heavy tax upon agriculture which is sorely felt at present from two causes; the increase in production, which reduces prices, and the advance of freight-rates by railroads, which tends to depress prices still further. The evil is becoming unendurable, and should be remedied by the speediest and wisest method practicable. Hon. Samuel Shellabarger, of Ohio, has introduced into the House of Representatives the following bill to secure uniformity in rates of local and through freight:

Be it resolved, &c., That the compensation authorized and contemplated by the second section of the act of the fifteenth of June, anno Domini eighteen hundred and sixty-six, entitled "An act to facilitate commercial, postal, and military communication among the several States," for the several descriptions of service named in said section, shall be charged at uniform rates per mile for the transportation of the same amount and description of freight, and the same description of passengers; and way-passengers and freight shall not be subjected to higher rates of charge per mile than the lowest rates charged by the same line, for the same services, over any other part of the said line; and any person or persons who shall be subjected to, or demanded to pay, any excessive charge in violation of the provisions of this act, may recover, from the party making the charge, such excess so either demanded or paid, together with costs and reasonable counsel fees, in any court of competent jurisdiction: *Provided*, That the provisions of this act shall not prohibit any common carrier, coming within its provisions, from receiving just compensation for the necessary expenses of lading and unlading way-freights: *And provided, moreover*, That the provisions of this act shall apply to all common carriers in carrying passengers or freight on their way from one State to or through another State.

IMPORTS AND CONSUMPTION OF COFFEE IN THE UNITED STATES.—In 1872 there were imported (into all except the Pacific States) 277,636,258 pounds of coffee; exported, 5,856,700 pounds; retained in the country, 271,779,558 pounds. In 1871 there were imported 322,700,479 pounds; exported, 5,768,695 pounds; retained in the country, 316,931,784 pounds; showing a decrease in 1872 of 45,152,226 pounds. By adding the stock on hand January 1, 1872, and deducting the stock on hand January 1, 1873, the actual decrease in consumption in 1872 is shown to be 44,891,027 pounds. In 1872, New York imported 165,252,428 pounds—just about three-fifths of the total; the sources of the coffee supply of the country will therefore be pretty fairly indicated by the shipments to New York. These were: from Brazil, 83,304,960 pounds; Maracaibo, 20,947,510 pounds; Java and Sumatra, 17,923,979 pounds; Laguayra and Porto Cabello, 9,464,905 pounds, and San Domingo, 7,812,502 pounds. The remainder was from Costa Rico and New Granada, Bolivar City, Jamaica, Porto Rico, Curaçoa, Cuba, Manila, Singapore, Ceylon, Bombay, Africa, and Mexico. A considerable amount of coffee is reshipped to the United States from European ports, which is produced in Brazil, and it is estimated that from 70 to 80 per cent. of our supply is drawn from that country. The estimated consumption of the Pacific States for 1872 is 12,000,000 pounds, making total for the country 282,718,738 pounds.

The value in gold of imports of coffee at ports of shipment, (exclusive of the Pacific States,) as shown by custom-house returns, was, in 1872, $25,284,179; in 1871, $16,041,387. It will be noticed that though the amount of coffee imported in 1872 was much less than in 1871, it cost much more. These results are mainly attributable to the very short crop in Brazil, and a partial failure of the crop in Java in 1871.

The average wholesale price in gold at New York was, in 1872 and 1871, respectively, for Brazil, $18.42 and $15.91 per 100 pounds; for San Domingo, $15.37 and $13.55; for Maracaibo and Laguayra, $18.18 and $16.22; for Java, $21.30 and $21.29.

The following statement shows the receipts and consumption of the country, exclusive of the Pacific States, for the past 22 years:

Year.	Receipts.	Consumption.	Year.	Receipts.	Consumption.
	Pounds.	*Pounds.*		*Pounds.*	*Pounds.*
1872	277, 636, 258	271, 718, 738	1861	182, 244, 627	187, 045, 786
1871	322, 700, 479	316, 609, 765	1860	185, 779, 689	177, 111, 923
1870	282, 540, 737	280, 911, 672	1859	248, 527, 306	222, 610, 300
1869	242, 609, 252	243, 441, 117	1858	227, 656, 186	251, 255, 099
1868	238, 012, 079	223, 200, 937	1857	217, 871, 839	172, 565, 934
1867	236, 322, 811	203, 506, 671	1856	230, 913, 150	218, 225, 490
1866	165, 392, 983	159, 918, 881	1855	238, 214, 533	218, 378, 287
1865	133, 574, 397	128, 146, 356	1854	182, 473, 853	179, 481, 083
1864	145, 304, 957	109, 086, 703	1853	193, 112, 300	175, 687, 790
1863	75, 260, 417	79, 719, 641	1852	205, 542, 855	204, 991, 595
1862	98, 558, 680	88, 989, 911	1851	216, 043, 870	184, 225, 700

PRODUCTION OF ANTHRACITE COAL IN PENNSYLVANIA.—The increase in the amount of anthracite coal annually mined in Pennsylvania has been very steady from the beginning, in 1820, when 365 tons were produced. The following table shows the amount mined in each successive year:

Year.	Tons.	Year.	Tons.	Year.	Tons.	Year.	Tons.
1821	1, 073	1834	376, 636	1847	2, 882, 309	1860	8, 513, 123
1822	3, 720	1835	560, 758	1848	3, 089, 238	1861	7, 954, 264
1823	6, 951	1836	684, 117	1849	3, 242, 966	1862	7, 869, 407
1824	11, 108	1837	869, 441	1850	3, 358, 899	1863	9, 566, 006
1825	34, 893	1838	738, 697	1851	4, 448, 916	1864	10, 177, 475
1826	48, 047	1839	818, 402	1852	4, 993, 471	1865	9, 652, 391
1827	63, 434	1840	864, 379	1853	5, 195, 151	1866	12, 703, 882
1828	77, 516	1841	959, 773	1854	6, 002, 334	1867	12, 988, 725
1829	112, 083	1842	1, 108, 412	1855	6, 608, 567	1868	13, 834, 132
1830	174, 734	1843	1, 263, 598	1856	6, 927, 580	1869	13, 723, 030
1831	176, 820	1844	1, 630, 850	1857	6, 644, 941	1870	15, 849, 899
1832	363, 271	1845	2, 013, 013	1858	6, 839, 369	1871	15, 113, 407
1833	487, 749	1846	2, 344, 005	1859	7, 808, 255	1872	18, 400, 000

The production (estimated) of 1872 was 3,286,593 tons over that of 1871. This large increase is accounted for in part by the fact that in 1872, for the first time in several years, the work of mining anthracite coal in Pennsylvania was prosecuted without the interruption of strikes through the whole year. It is found that the increase in consumption has equalled that of production, and, from data deemed reliable, it is estimated that the increase of consumption in 1873 over that of 1872 will be nearly, if not quite, as great as the latter was over that of 1871. Of this coal, 7,513,115 tons were transported from the mines by the Reading Railroad Company, which now owns or controls 1,385 miles of single track. Its receipts for transportation, based on the tonnage of the main line, were, in 1871, $1.808 per ton; in 1872, $1.544, the average receipts per ton for the previous ten years being $1.94.

COST OF GROWING OATS AND CORN IN ILLINOIS.—Mr. H. B. Gurler, of De Kalb County, reports to this Department the cost, per acre and

per bushel, of growing oats and corn on his farm, as ascertained by keeping a careful account of each item of expense. Interest on the value of the land, estimated at $40 per acre, is charged, as is each day's work by man, boy, or beast, but there is no charge for seed and no credit given for straw or corn fodder. In seeding, cultivating, and harvesting, improved farming tools and machinery were used. A field of oats, containing 15 acres, yielded 800 bushels, or 53⅓ bushels per acre; the cost of raising was $9.45 per acre, or 17$\frac{7}{10}$ cents per bushel. The oats when thrashed were worth in market 16 cents per bushel. One field of corn, containing 33 acres, yielded 45$\frac{5}{11}$ bushels per acre; the cost of raising was $10.16 per acre, or 22½ cents per bushel. Another field of 13 acres yielded 50 bushels per acre, and the cost of raising was $12.27 per acre, or 24½ cents per bushel. Because it costs Mr. Gurler more to raise oats than they will bring in market, he does not consider that he is thereby doing either an unprofitable or an unwise business. His farm is stocked with cows, hogs, and long-wool sheep, and his rule is to feed out to them all the corn, oats, and hay it produces; on which account he reports that it is constantly improving in productiveness.

The fifteen acres of oats were sown on corn-stalk ground without plowing, and cultivated with sulky corn-plow, and well harrowed. Cost, 1 day's work in sowing oats, $1.50; 3 in cultivating with man and team, $9; 2½ in harrowing, $7.50; 3 men two days in harvesting, at $2.50 per day, $15; 1 boy two days, at $1 per day, $2; 1 team 2 days, at $1.50 per day, $3; 4 men 1 day in stacking, $8; 2 boys 1 day, $2; 3 teams 1 day, $4.50; 6 men part of a day in thrashing, at $1.50, $7.30; 4 teams ¾ of a day, at $1.50, $4.50; 1 boy ¾ of a day, at 75 cents, 55 cents; board of thrashers, $4; of teams, $1; paid thrashers $11.84; interest on fifteen acres at $40 per acre, at 10 per cent., $60; total amount, $141.69, or $9.45 per acre.

The cost of raising 33 acres of corn was, for plowing, at $1.50 per acre, $49.50; 3 days' harrowing before planting, $9; marking with four-row marker, $3; *planting:* 2 men 2 days, at $1.50, $6; 1 team 2 days, at $1.50, $3; 1 planter 2 days, at $2, $4; *cultivating:* 6 days' harrowing before the corn came up, at $3, $18; 22 days' cultivating, man, team, and sulky-plow, at $3, $66; *harvesting:* 30 days' work, at $1.50, $45; interest on 33 acres, at $40 per acre, $132; total amount, $335.50, or $10.16 per acre. The product was 1,500 bushels of corn.

FOREST-TREE PLANTING IN KANSAS.—A correspondent of the Department, in Republic County, Kansas, in urging public attention to the subject of forest-tree planting in that State, remarks:

> Many thousand trees planted last spring grew well, both native and foreign. A great many are putting out fine groves and orchards; but homestead settlers are generally too poor to plant as large groves as this bleak, windy country needs.
>
> We are all much in hopes that Congress may do something to help us. If they would give any one all the land he would plant in trees, perhaps some would be planted. But if they would give four or ten times as much as was well planted and taken care of, it would be some inducement for eastern capitalists to have trees planted here; and would benefit the nation and the State more than many settlers could do without capital. Where there is a soil so fertile, something should be done to make it fit for comfortable homes and a virtuous people.

A bill is before Congress for the encouragement of tree-planting and other agricultural development on the western plains. The Western Forest-tree and Hedge-growing Association, of Kansas, has been incorporated in that State with the design of encouraging systematic forest-culture on a portion of the great treeless plains. Its board of directors is mainly made up of men who have gained a wide reputation as tree-growers and agriculturists. Among them are Dr. John A. Warder, of Ohio; Robert

Douglas, of Illinois; and S. T. Kelsey, Alfred Gray, J. K. Hudson, W. H. Smallwood, and T. J. Peter, of Kansas. The bill referred to grants to this association one section of land for each mile in distance between Fort Dodge and Pueblo in Colorado, (both points being on the Arkansas River,) on the condition that it shall grow eighty acres in forest-trees on each section so granted, and shall put in cultivation one experimental farm of not less than forty acres in every fifty miles between the two points named, upon which shall be cultivated all the varieties of seeds and grains adapted to that climate, and, furthermore, shall annually report to the Department of Agriculture accurate results of all experiments in growing grains, trees, and other products from seeds.

FRUIT FROM THE MOST VALUABLE SEED DISTRIBUTED BY THE DEPARTMENT OF AGRICULTURE.—The secretary of a stock association in Pendleton County, Kentucky, reports that the annual and monthly reports of the Department of Agriculture, which have been distributed in that section, are leavening it with an increased desire for agricultural information, and are already showing good results in attempts to introduce better modes of agriculture and improved breeds of stock.

DESPONDENCY IN IOWA.—The secretary of the Cedar Falls Farmers' Club, Black Hawk County, Iowa, after reporting that hogs are selling at 2¾ to 3¼ cents, three-year old steers at 3 to 3½ cents per pound, live weight, and oats and corn at 15 to 18 cents, and wheat at 65 to 95 cents per bushel, adds:

We are suffering severely from debts, low prices of farm products, and enormous railroad charges on freights. Real estate is worth 30 per cent. less now in Iowa than three years ago, and money is very scarce. The general cry everywhere is, "The railroad companies will ruin us." Last year our apple crop was abundant, but all varieties ripened prematurely, and were badly injured by the codling moth. A majority of many varieties of apple-trees in our oldest orchards were badly injured by the cold of December 23 and 24, 1872, when the mercury ranged from 23° to 35° below zero. The bodies of very many of them are burst from the limbs to the ground. I know but few varieties that are sufficiently hardy to endure this climate—latitude 42° 30′. The only varieties that I can recommend are Dutchess of Oldenburg, Tetofsky, Red Astrachan, Fameuse, Haas, Saxton, Plumb's Cider, and Ben Davis. Ben Davis is the only variety we have which is a good keeper, and that is of poor quality. We are experimenting with seedlings, for the purpose of getting, if possible, a few good winter varieties. All varieties of the tame plum have failed here, except the Lombard. That is hardy and productive. We cultivate a number of varieties of the grape, but the Concord is worth more than all other. Peaches are too tender. The only variety of the pear which I have tried that has not been ruined by the "fire-blight," is the Early Catherine. The Early Richmond and English Morello cherries are hardy enough, but not productive here.

CROPS AND FARM ANIMALS IN KANSAS.—The secretary of the Neosho Valley Agricultural Society, Labette County, reports as follows:

The weather has been favorable for prosecuting all kinds of farm work. It was warm, and very dry, from October 1 to December 18; at the latter date we had snow fall to the depth of a foot. Notwithstanding the very favorable fall weather, there remains in the fields about one-sixth of the entire crop of corn, not including a small portion of shock-corn. The area sown in wheat is 50 per cent. greater than that of any previous year. About 90 per cent. of the seeding was done with the drill, between September 12 and October 8. The ground was in good condition, and the prospect for a crop is at present altogether favorable. Our work-horses do not receive requisite care. Indeed, the greater proportion are little better cared for than range-stock, which obtains no better shelter than is furnished by a patch of brush or a rick of straw. At this time (January 7) all the horses in the towns, and about half in the country, are affected with the epizooty. The disease is of a mild form, partially disabling horses for two or three weeks, resulting in no deaths, except where horses have been hard driven while sick. With proper diet and rest there is no ground for apprehending serious trouble from the distemper; in fact, it seems to be affecting the people here worse than it does the horses. But a small number of hogs are fatted for the market as yet, but there is a fair showing of stock hogs. Our farmers are manifesting a very commendable spirit in procuring imported breeds. There is only a very limited number of sheep in this county.

STATIONARY FARMING.—Our correspondent in Douglas County, Georgia, reports that the 1st of January, 1873, finds most of the farmers in that section where they were on the 1st of January, 1872. After paying for fertilizers, help, and provisions, they have little or nothing left for the pocket or to pay debts with.

FERTILIZERS FOR TOBACCO.—Mr. James M. Crafts, of Whately, Franklin County, Massachusetts, sends to this Department the following interesting account of the extensive use of manures and other fertilizers, and of the manner of applying them in raising tobacco in that section:

I am one of a company of five persons who, in the last two years, have bought and shipped from Whitehall, New York, over 80 car-loads of horse-manure. Other parties have bought fully as much in Middlebury, Rutland, Montpelier, and Saint Johnsbury, Vermont. The cost at our station has averaged about $10 per cord. Other parties have bought manure from the East Albany cattle-yards—perhaps 50 car-loads in less than two years—all of which, I think, has been sheep-dung. Others have been to New Haven, Connecticut, and still others to Boston and Cambridge; and now two of our farmers have been to Canada and bought 25 car-loads. A car-load of horse-manure contains about 7 cords, perhaps 6½ on the average. This is generally obtained from livery-stables. That from Whitehall, New York, is from stables where canal horses and mules are kept. These are fed highly with grain, and the manure is very valuable. It is used on tobacco lands at the rate of about 10 cords to the acre. Probably there is no other species of manure which affords in such abundance all the elements of tobacco. It is rich in potash, phosphoric acid, magnesia, &c.

I will add a word about our mode of applying manure to tobacco. If, after spreading broadcast, we plow it under, the plowing is very shallow—not more than 5 or 6 inches deep. But as a rule we prefer to allow the manure to ferment and become fine, then spread it even and work it in upon the plowed surface with the gang-plow or with one of the wheel pulverizing-harrows; and we like the kind that is attached to a straight piece of plank with a tongue and seat. We would like to go over the ground as many as eight times with it; in fact we generally do go, say, four times one way and as many the other, finding our pay for the extra labor in the fineness of the soil. We are doing this work more thoroughly than we used to, and think we are well paid for it. We next fit the hills by ridging the land 3½ feet apart and the hills 2 feet. Under this course we have found that we do not get much advantage from the use of superphosphates in the hill.

Some have tried experiments by using wheat-shorts as a fertilizer for tobacco, at the rate of 3 tons to the acre. A member of our club raised an acre of tobacco with shorts as a fertilizer, and the crop was a good one, estimated at 1,800 pounds. On another piece he tried Indian meal at the same rate with not nearly as good results. On 4 acres he used 800 pounds of shorts and 100 to 150 pounds of superphosphate strewed (after marking) on the marks, and then ridged so that the hills were made over the shorts and superphosphate. This gave him the best tobacco he ever grew, though he had used, by working in on the plowed surface, about 8 cords of manure and 800 pounds of Peruvian guano to the acre.

IMPROVIDENT HABITS OF THE FREEDMEN.—A casual correspondent writing from Morehouse Parish, Louisiana, says:

I do not know yet how I shall arrange with my freedmen for another season; have been hoping, each year, they would save enough to rent and stock themselves, but they will be as poor to start the coming year as they have been heretofore. I have tried hard to induce them to lay out something in a useful way—have been so much in earnest about it that I have never kept goods for sale, (which would be very profitable,) because I knew it would retard their progress toward comfort and competence, though it seems that I have been foregoing this profit to no good purpose, as they get credit with the Dutch Jews, who abound hereabouts. To give you some idea of how easy they make money, I will state the case of one who rents 25 acres of us. He commenced preparing the middle or the latter part of February; in July and August there was little or nothing to do in the field; he finished gathering about the 1st of November, making 300 bushels of corn, and 15 bales of middling cotton, worth 19 cents—clearing about $1,300. Considering loss of time for Saturdays, (which are regularly kept for holidays,) and rainy weather, you will see that this crop was made and put on the market in about four months of working time. Can any other crop beat that? He works for two-thirds of the corn and three-fourths of the cotton; that is, we receive one-third and one-fourth for rent, which pays us about $14 per acre when well worked, as in the above case. But nearly all the others, who have rented on the same terms, have failed to make money, either for themselves or us; in fact, the only full crops, outside of the above, have been made under my own supervision, where they had to do as I said.

RAIN-FALL IN CALIFORNIA.—The crops of California depend, as nowhere else in this country, upon the comparative amount of rain-fall of the winter or rainy season. If the amount is above an average of a series of years, a good crop of grain is assured. As the rain-fall of different seasons is exceedingly variable, the rain-gauge is consulted carefully, and rain prospects are canvassed with much solicitude. Nearly all the rain of the year falls between October and April, and a large proportion within ninety days from December 1. Yet there is no invariable law regarding it. There is much interest felt regarding the probable rain-fall of January, February, and March, with small data for accurate prognostication, as a study of the record of former years will show. If any weather bureau could deduce from these or any other facts a law governing rain-fall, it would prove of immense benefit to agriculture. The record is as follows:

Years.	October, November, December.	January, February, March, April, following.	Total.	Years.	October, November, December.	January, February, March, April, following.	Total.
	Inches.				*Inches.*		
1860	5.38	9.38	14.76	1867	16.66	15.82	32.48
1861	10.81	22.92	33.73	1868	3.39	12.60	15.99
1862	2.68	8.54	11.32	1869	4.93	8.37	13.30
1863	3.30	3.64	6.94	1870	1.58	6.13	7.71
1864	14.70	7.34	22.04	1871	11.20	11.30	22.50
1865	3.27	12.19	15.46	1872	7.18*	.....	.....
1866	11.94	13.36	25.30				

* To December 26.

WHEAT CROP IN DODGE COUNTY, WISCONSIN.—This is one of the largest wheat-growing counties in the State. Its product in 1869, as reported for the census, was 2,294,538 bushels; an estimate deemed accurate, places the crop of 1872 at 2,100,000 bushels; a falling off from 1869 of a little over 8 per cent.

PRODUCT OF SEEDS FROM THIS DEPARTMENT.—Our correspondent in McLennan County, Texas, reports that from one quart of corn, planted one month later than his other corn, the product was at the rate of 105 bushels to the acre; that from half a peck of wheat the yield was 12½ bushels, one hundred fold; that he raised short-stemmed Brunswick cabbages, weighing 9½ pounds each, and Italian red onions, weighing 11 ounces each; and that he put in market, last spring, tomatoes and beets of superior quality, ten days in advance of any other; all of which were from seeds sent out by the Department of Agriculture.

AGRICULTURAL IMPROVEMENT.—A correspondent in Davidson County, North Carolina, reports that the farmers in the county are manifesting a new interest in improving their lands and dwellings. Improved methods of cultivation are being adopted; some are putting up new buildings, others are repairing old ones, and the spirit of progress and thrift appears to be leavening the county.

FRUITFULNESS IN NEBRASKA.—A correspondent in Gage County, represents that hay and grain are very abundant in that section. Corn and oats sell at 15 cents per bushel; good barley at 20, and wheat at 85. He recommends the region for sheep-husbandry. He sold his last clip of wool, unwashed and unsorted, at Beatrice, the county-seat, for 46 cents per pound, and goes into winter quarters with over 700 sheep,

MILLVILLE FARMERS' AND GARDENERS' CLUB.—This club, located in Cache County, Utah, reports through its secretary, F. Yeates, experiments with varieties of seeds and small grains received from this Department, the results of which were for the most part favorable. The members of this club, now including nearly all the farmers in the community, are represented as alive to their own interests, and intent on finding out the most successful modes of farming and gardening. With this view they have resolved to hold monthly meetings for mutual instruction, and, in the growing season, to send out committees to inspect the treatment of seeds, the different modes of cultivation in practice, their respective results, &c.

PRODUCTS OF BLEDSOE COUNTY, TENNESSEE.—The secretary of the Farmers' Club of this county sends us a report of which the following is a digest. Of live animals driven or shipped to southern markets in 1872, there were 3,000 fat hogs; 1,200 cattle of an average gross weight of 950 lbs.; and 200 mules and horses, the average value being $100. During the year 10 per cent. of the hogs died of cholera and other diseases, and about 1,000 were slaughtered in the county.

The products of the field are put down as follows: total of wheat, 20,000 bushels; average yield per acre, 10 bushels; of corn, 280,000, average, 20; of oats, 30,000, average, 20; of Irish potatoes, 10,000, average, 40; of sweet potatoes, 20,000, average, 80. Tons of hay, 250; average yield per acre, 1,500 lbs. The census returns give the corresponding products of the county for 1869 as follows: total of wheat, 22,034 bushels; of corn, 201,667; of oats, 21,550; of Irish potatoes, 6,256; of sweet potatoes, 4,714; of hay, 356 tons; of hogs, 11,048. Our correspondent reports that, notwithstanding fruit-culture receives in the county far less attention than it merits, apples, pears, and peaches are plenty, and that the latter grow almost spontaneously. He says:

An entire orchard can be hewn down, and in five years it will be bearing as vigorously as ever. Four or five strong shoots will spring up at or near the stump, forming a group of trees instead of the one hewn down. The old stump does not heal over, but decays in a few years.

The first "Collins steel plow" was introduced into the county three years ago, and now the farmers are fast superseding their old bungling plows and tools by that and other first-class farm implements.

LOS ANGELES COUNTY, CALIFORNIA.—A correspondent of the Department writes as follows respecting the county of Los Angeles.

The soil is a rich sandy loam, at Westminster, where I live. Our surface wells are about eight feet deep. This season has been too dry for us to produce good crops. All the rains fall during the months from December to June. It is now over seven months since we had any rain. The average rain-fall is about ten inches. We have at Westminster over thirty flowing artesian wells, and intend to irrigate our crops during the coming season. Our greatest difficulties are found in the lack of wood, or timber, and the severe winds which sweep over our treeless plains during the winter months. These winds, which come from the barren region of Western Arizona, are generally dry and hot. Our soil is so loose and sandy that these winds move it easily. The sandstorms are very destructive to young grain, often covering a whole field in a single day. To prevent the destructive effects of this wind, many in this county are planting willow hedges, obtaining the willows from the vicinity of the rivers, where they grow in abundance. These hedges are intended to answer the purpose of wind-breaks, as well as fences.

DESTRUCTION OF THE BUFFALO.—There is more than a probability that the buffalo will disappear with the Indian; that both the native man of North America and the animal mainly relied upon for his meat and his clothing, will become extinct. The Atchison, Topeka and Santa

Fé Railroad reached Fort Dodge, above the great bend on the Arkansas River, in Kansas, on the 23d of September, 1872. From that date to December 31, the shipment at that station of buffalo-hides was 43,029; of buffalo-meat, 1,436,290 pounds. These figures do not include the many buffaloes shot by sportsmen in warm weather, nor those slain for food by frontier residents; and, although they show a slaughter of over 43,000 in a little over three months, they are considerably less than they would have been had not the prevalence of the horse-disease seriously hindered the transportation of hides and meat to the station. That hinderance having disappeared, it is estimated that the shipments for January will exceed those of the preceding months by 150 per cent., and that, for the season of 1872–'73 the slaughter in the neighborhood of Fort Dodge will amount to at least 100,000 buffaloes.

INDUSTRIAL DIVERSITY.—Some statistics of Union County will serve to illustrate the agricultural variety and thrift which characterize that section of Southern Illinois. This small county lies on the Mississippi, and is next to the border county on the south. According to the census of 1870, it had, in 1869, 75,832 acres of improved land, 83,606 acres of wood-land, and 5,300 acres of other unimproved land. The cash value of its farms was $3,383,201; of the products of its orchards, $150,576; of its market gardens, $24,510; of its forests, $12,031; of its home manufactories, $26,284; value of its animals slaughtered, or sold for slaughter, $137,288; amount of wheat produced, 180,231 bushels; of corn, 679,753 bushels; of oats, 124,473. There are three railroad stations in the county—Anna, Cobden, and Dongola. In 1872, among the products received and forwarded were, at Anna Station, 38,300 barrels of lime, 9,300 of flour, 4,800 of meal, 2,900 of onions, 2,940 of apples, 4,780 of sweet potatoes, 1,140 of dried fruit, 96 bales of cotton, 150 hogsheads of tobacco, 10,000 tons of fire-clay, 1,000 of white clay, 75,000 gallons of stone-ware, 9,866 bushels of peaches, 4,490 crates of berries, 5,000 pounds of wool, 22,100 pounds of pie-plant, 3,146 pounds of green hides, 609 pounds of dry hides, and 10 car-loads of poultry. At the Cobden Station, 8,514 bushels of strawberries, 1,653 of raspberries and blackberries, 190 of canned raspberries and blackberries, 450 of cherries, 22,885 of apples, 46,396 of peaches, 6,192 of pears, 12,705 of tomatoes, 8,000 of preserved apples, 7,000 of canned peaches, 417 barrels of sweet potatoes, 3,110 pounds of grapes. At the Dongola Station, 6,000 barrels of sweet potatoes, 4,300 of onions, 3,200 of apples, 5,100 of flour and meal, 100 bales of cotton, 3,100 flour-barrels, 2,212,000 feet of lumber and ties. The canned peaches and berries specified above were put up by Messrs. Cooledge & Wells, and the preserved apples by the Alden Fruit-Preserving Company, both establishments being located at Cobden. It was feared that the fruit trees, especially the peach, in that section had been greatly injured by the extreme cold weather in the latter part of December; but fruit-growers, who have made examination, concur in testifying that, owing to the dry autumn, the buds were in a remarkably good condition to resist the cold, and, in fact, have received comparatively little injury.

"BLOODY MURRAIN."—Mr. C. R. Moore, of Johnsontown, Virginia, writes to the Department as follows:

One of my neighbors, a short time since, lost four out of six head of cattle with what is here called "bloody murrain"—bloody urinary discharges. I went to see him, to learn the particulars, which I send you. All his cattle were attacked. After losing four he gave the remaining two a pint each of petroleum, such as he burned, by pouring it down their throats. They recovered. He opened those which died, and found the bladders much distended with what appeared to be blood, but which was probably

bloody urine. As this disease is almost always fatal here, the cure is valuable, if it should prove so in other instances.

EXPERIMENTS IN SILK CULTURE.—Mr. V. P. Hoffman, secretary of the Egg Harbor City (New Jersey) Agricultural Society, writes to the Department as follows:

This society ordered a quantity of silk-worm eggs from California, and distributed the same gratis among the members, and others who were willing to experiment therein. With the exception of two, all had no previous knowledge of the rearing and culture of the same. As there were but few mulberry trees on hand the greater part of the worms were fed with Osage-orange leaves; but little difference was noticeable in the appearance of the cocoons and reeled silk; the reeled silk from the Osage-orange was said, by adepts, to be somewhat brittler than that of the mulberry. Specimens of cocoons and reeled silk were exhibited in the annual agricultural fair of this society by three parties, and they were all awarded some of the best premiums at our disposal. It is our object to foster this branch of industry as much as possible, resting upon the supposition that it will, in a not very distant time, prove one of the most remunerative pursuits, as our climate, during the culture of the worm, is very favorable.

NEW ZEALAND FLAX.—A New Zealand correspondent of the London Times states that an important discovery has been made in connection with the New Zealand flax, (*Phormium tenax*) the value of which has been tested by experiments made by Dr. Hector, chairman of the Flax Commission. Dr. Hector's attention, it seems, had been attracted to the durability of the fishing-lines of the natives, which were not rotted by the wet, as were other articles of the hempen manufacture. Meeting an old Maori woman one day, he inquired how these fishing-lines were prepared, and was told that the hands of the makers were always kept anointed with the oil of the weka (the New Zealand wood-hen) while they were plaiting the lines. Dr. Hector, upon this hint, proceeded to investigate the matter, and instituted a series of experiments, the result of which was the discovery in question, that oiled phormium, in the form of rope, was vastly stronger and more durable than the common phormium, or even the manila. The experiments consisted in running over a revolving shaft three pieces of rope of the same size, made respectively of common phormium, manila hemp, and oiled phormium, with weights attached to them, wetting all of them occasionally with both fresh and salt water. The result was that the common phormium ran 22 days, the manila 45 days, and the oiled phormium 95 days, the latter becoming more supple, and, as Dr. Hector expresses it, more like catgut in its wear, after running for a time.

AGRICULTURAL STATISTICS OF THE NORTHWEST PROVINCES OF INDIA.—The following is an analysis of official statistics of these provinces, (which include twenty-two districts,) for the year 1869–'70: Total area, 53,431,188 acres; cultivated area, 24,543,841; barren, 17,-829,919; fallow, 1,690,789; old fields, 7,024,037. Of the total area, 33.37 per cent. is reckoned as "barren," 4.38 per cent. "revenue-free," 3.16 per cent. "fallow," 13.15 per cent. "old culturable," and 45.94 per cent. "cultivated." Of the total "culturable," 73.80 per cent. is cultivated. The total area bearing two crops the same season, ("dofus lee" area,) is 1,714,964 acres, which is 6.99 per cent. of the cultivated. The total product, in pounds, of rice was 1,521,859,566; of cotton, 75,767,590; of wheat and barley, 4,384,225,284. Of these, 20.46 per cent. of the rice, 49.85 per cent. of the cotton, and 17.84 per cent. of the wheat and barley were exported, the remainder, in each case, being retained for home consumption.

MARKET PRICES OF FARM PRODUCTS.

JANUARY, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.

Articles.	Price.		
NEW YORK.			
Flour, superfine State...per bbl.	$5 75	to	$6 35
extra State.....do...	6 90	to	7 90
superfine western ...do...	5 75	to	6 35
extra to choice western, per barrel.....	6 90	to	12 75
southern shipping, common to choice ..per bbl.	6 10	to	8 75
southern family, ordinary to choice.....do...	8 50	to	12 50
Wheat, No. 1 spring ...per bush.	1 70	to	1 72
No. 2 spring .....do...	1 58	to	1 66
winter, red, west'n ..do...	1 70	to	1 85
winter, amber, western, per bushel	1 85	to	2 00
winter, white, western, per bushel	1 80	to	2 20
Rye, State.....per bush.	95	to	97
western .....do...	93	to	95
Barley .....do...	92½	to	1 12
Corn .....do...	64	to	69
Oats .....do...	44½	to	52½
Hay, for retail.....per ton.	26 00	to	35 00
for shipping .....do...	23 00	to	24 00
Pork, mess.....per bbl.	13 25	to	13 50
prime .....do...	— —	to	11 50
prime mess .....do...	14 00	to	— —
Lard .....per lb.	7⅞	to	8⅛
Beef, plain mess, old and new, per barrel	4 00	to	12 00
extra mess, old and new, per barrel	8 50	to	13 50
Butter, western .....per lb.	11	to	21
State dairy .....do...	—	to	—
Cheese, western dairy .....do...	12½	to	13⅜
State factory .....do...	12	to	14½
Cotton, ordinary to good ordinary .....per lb.	17⅜	to	19¼
low middling to good middling .....per lb.	19½	to	23½
Tobacco, lugs, all grades...do...	9¼	to	10½
common to medium leaf, all grades..per lb.	10	to	11½
Wool, Saxony fleece.....do...	62½	to	75
Merino, full blood.....do...	60	to	75
combing.....do...	60	to	65
pulled.....do...	45	to	60
tub-washed.....do...	62½	to	72½
California spring clip, unwashed .....per lb	45	to	50
California fall clip, unwashed .....per lb.	30	to	38
Texas.....per lb.	23	to	60
BOSTON.			
Flour, western, superfine..per bbl.	5 25	to	6 25
western extras .....do...	6 75	to	10 00
western choice .....do...	9 00	to	12 50
southern extras.....do...	7 00	to	7 50
choice Baltimore ....do...	10 00	to	12 00
Wheat.....per bush.	1 65	to	2 00
Rye .....do...	1 05	to	1 10
Barley .....do...	90	to	1 20
Corn, southern yellow.....do...	74	to	75
western yellow.....do...	74	to	75
Oats .....do...	50	to	60
Hay, choice eastern and northern .....per ton	27 00	to	28 00
choice western .....do...	— —	to	— —

Articles.	Price.		
BOSTON—Continued.			
Beef, western mess.....per bbl.	$12 00	to	$12 50
western extra.....do...	13 00	to	14 00
Pork, prime .....do...	11 50	to	12 00
mess .....do...	14 00	to	14 50
Lard .....per lb.	8½	to	9
Butter, N. Y. and Vt .....do...	15	to	34
western .....do...	12	to	30
Cheese, N. Y. and Vt. factory, per pound.....	12	to	14½
N. Y. and Vt. dairy, per pound	11	to	13½
western factory, good to choice .....per lb.	12	to	14½
Cotton, ordinary to good ordinary .....per lb.	17¾	to	20
low middling to good middling .....per lb.	20	to	26
Tobacco, lugs .....do...	10	to	10½
common to medium leaf .....per lb.	11	to	12
Wool, Ohio and Pa .....do...	63	to	75
Michigan .....do...	62	to	66
other western .....do...	60	to	65
pulled.....do...	40	to	75
combing fleece.....do...	70	to	75
California .....do...	23	to	50
Texas .....do...	45	to	55
PHILADELPHIA.			
Flour, superfine.....per bbl.	4 50	to	5 50
extras .....do...	5 75	to	6 50
family .....do...	7 50	to	8 75
fancy .....do...	9 00	to	11 00
Wheat, winter red.....per bush.	1 90	to	1 95
winter, amber .....do...	1 95	to	— —
winter, white.....do...	2 00	to	2 10
spring .....do...	1 70	to	1 75
Rye .....do...	92	to	— —
Corn .....do...	61	to	65
Oats .....do...	45	to	51
Pork, mess .....per bbl.	13 00	to	13 75
Lard .....per lb.	7¾	to	8
BALTIMORE.			
Flour, superfine .....per bbl.	5 25	to	8 50
extras .....do...	6 75	to	10 00
family and fancy ....do...	8 25	to	12 00
Wheat, white, fair to choice, per bushel	1 85	to	2 25
amber .....per bush	1 95	to	2 27
red.....do...	1 80	to	2 10
Rye .....do...	90	to	1 00
Corn, white southern.....do...	63	to	65
yellow southern.....do...	62	to	64
mixed western .....do...	62	to	—
Hay, western baled, good and prime .....per ton.	32 00	to	35 00
Pork, mess .....per bbl.	13 50	to	14 00
Lard .....per lb.	7⅞	to	9¼
Butter, choice western .....do...	27	to	35
fair to good west'n ..do...	20	to	26
Cheese, western factory ....do...	14	to	14½
eastern factory ....do...	14½	to	15
Cotton, ordinary to good ordinary .....per lb.	17½	to	18¾
low middling to middling .....per lb.	19½	to	20¼

Market prices of farm products—Continued.

Articles.	Price.		
BALTIMORE—Continued.			
Wool, unwashed, free from burs, per pound	$0 35	to	$0 38
tub-washed ...do...	55	to	60
pulled ...do...	35	to	40
CINCINNATI.			
Flour, superfine ...per bbl.	5 60	to	6 25
extra ...do...	7 50	to	7 75
family and fancy ...do...	7 75	to	9 25
Wheat, red winter, No. 1, per bushel	1 68	to	— —
red winter, No. 2, per bushel	1 62	to	1 64
Hill ...per bush.	— —	to	— —
white ...do...	— —	to	— —
Rye ...do...	88	to	91
Barley ...do...	70	to	93
Corn ...do...	41	to	42
Oats ...do...	29	to	40
Hay, baled, No. 1 ...per ton	20 00	to	21 00
lower grades ...do...	16 00	to	18 00
Beef, plate ...per bbl.	13 50	to	14 50
Pork, mess ...do...	11 75	to	12 00
Lard ...per lb.	7	to	7½
Butter, choice ...do	22	to	24
fair to prime	14	to	21
Cheese, prime to choice factory, per pound	14	to	15
Cotton, ordinary to good ordinary ...per lb.	16½	to	17⅜
low middling to good middling ...per lb.	18⅜	to	21
Tobacco, lugs ...do...	8	to	22
leaf ...do...	10	to	30
Wool, common to fine fleece, per pound	50	to	55
tub-washed ...per lb.	60	to	62
unwashed, clothing ...do...	36	to	38
unwashed, combing ...do...	45	to	48
pulled ...do...	45	to	48
CHICAGO.			
Flour, white winter extras, fair to choice ...per bbl.	7 50	to	9 75
red winter extras ...do...	6 50	to	7 55
good to choice spring extras ...per bbl.	5 50	to	6 50
spring superfines ...do...	3 00	to	4 50
good to fancy Minnesota, per barrel	6 00	to	7 25
Wheat, No. 1 spring ...per bush.	1 28	to	1 29
No. 2 spring ...do...	1 23	to	1 24½
No. 3 spring ...do...	1 09	to	1 09½
Rye, No. 2 ...do...	68	to	69
Barley, No. 2 ...do...	65	to	66
Corn, No. 2 ...do...	31	to	31⅛
Corn, rejected ...per bush.	29½	to	—
Oats, No 2 ...do...	23⅝	to	25
rejected ...do...	—	to	—
Hay, timothy ...per ton	15 00	to	17 00
prairie ...do...	9 50	to	11 50
Pork, mess ...per bbl.	11 25	to	11 40
Beef, mess ...do...	8 50	to	9 00
extra mess ...do...	9 50	to	10 00
Lard ...per cental.	7 00	to	7 12½
Butter, strictly choice dairy, p. lb.	25	to	38
good to choice roll ...do ...	18	to	23
Cheese, New York factory ...do...	13½	to	14½
Ohio factory ...do...	11	to	13
western factory ...do...	11	to	13
Wool, tub-washed ...do...	55	to	65
fleece-washed ...do...	45	to	50
unwashed ...do...	33	to	38
pulled ...do...	48	to	50

Articles.	Price.		
SAINT LOUIS.			
Flour, winter superfine ...per bbl.	$4 50	to	$5 00
extras ...do...	5 25	to	7 50
choice ...do...	7 75	to	9 25
Wheat, No. 1, red winter ...per bus.	1 87	to	1 90
No. 2, red winter ...do...	1 85	to	1 88
No. 2, spring ...do...	1 16	to	1 18
Rye, No. 2 ...do...	72	to	75
Barley, No. 2 ...do...	65	to	—
Corn, No. 2, white ...do...	33	to	34
No. 2, mixed ...do...	33	to	—
Oats ...do...	26	to	34
Hay, prime timothy ...per ton.	17 00	to	19 00
Pork, mess ...per bbl.	11 75	to	12 25
Beef, mess ...do...	14 00	to	15 00
Lard ...per lb.	6⅞	to	7
Butter, prime to choice roll ...do...	20	to	25
choice packed ...do...	25	to	28
Cheese, New York factory ...do...	14½	to	15
Ohio factory ...do...	14½	to	15
northwest'n fact'y ...do...	14⅜	to	15
Cotton, middling ...do...	19	to	19½
Wool, unwashed, fine ...do...	30	to	35
medium ...do...	38	to	41
tub-washed, inferior ...do...	50	to	54
prime ...do...	60	to	—
NEW ORLEANS.			
Flour, superfine ...per bbl.	6 80	to	6 87½
extras ...do...	7 00	to	8 37½
choice ...do...	8 50	to	11 00
Corn, white ...per bush.	75	to	80
mixed ...do...	—	to	78
Oats ...do...	49	to	50
Hay, choice ...per ton	45 00	to	— —
prime ...do...	42 00	to	— —
Pork, mess ...per bbl.	13 50	to	13 75
Beef, Texas mess, old and new ...per bbl.	9 00	to	17 50
western mess ...do...	16 00	to	21 00
Fulton market ...do...	21 00	to	24 00
Lard ...per lb.	8½	to	10
Butter, choice western ...do...	25	to	26
choice Goshen ...do...	36	to	37
Cheese, western factory ...do...	13½	to	16
New York cream ...do...	17	to	18
Cotton, ordinary to good ordinary ...per lb.	17	to	18⅞
low middling to good middling ...per lb.	19½	to	21
Tobacco, lugs ...do...	8	to	9
low leaf ...do...	9	to	9⅝
medium leaf ...do...	9⅝	to	10⅜
SAN FRANCISCO.			
Flour, superfine ...per bbl.	4 20	to	4 50
extra superfine ...do...	— —	to	— —
higher grades ...do...	6 00	to	6 25
Wheat, State ...per cental.	1 80	to	2 05
Oregon ...do...	1 80	to	2 05
Barley ...do...	1 30	to	1 45
Oats ...do...	2 00	to	2 25
Corn, white ...do...	1 25	to	— —
yellow ...do...	1 35	to	— —
Hay, State ...per ton	15 00	to	23 00
Pork, mess ...per bbl.	19 00	to	20 00
prime mess ...do...	18 00	to	18 50
Beef, mess ...do...	— —	to	12 50
family mess ...per half-bbl.	9 00	to	10 00
Lard ...per lb.	9	to	11
Butter, overland ...do...	15	to	35
California ...do...	40	to	60
Oregon ...do...	18	to	20
Cheese ...do...	12	to	16
Wool, native ...do...	12	to	20
California ...do...	25	to	28
Oregon ...do...	25	to	28

LIVE-STOCK MARKETS.

CATTLE.—NEW YORK: *Common to fair*, $10 to $11.50 per cental; *good to prime*, $12 to $13.50; *extra*, $13.75 to $14.25; *holiday beeves*, $14.50 to $15.—*Average*, $11.75; *Milch cows*, $45 to $90 per head; *medium grass calves*, $11 per head; *fat milch veals*, 9½ to 10 cents per pound.

CINCINNATI: *Prime to extra shipping grades*, $5.25 to $6 per cental, gross; *prime to extra butcher's stock*, $4.50 to $5.25; *medium*, $3.50 to $4; *inferior*, $2.50 to $3. Receipts light.

CHICAGO: *Extra graded steers*, averaging 1,450 pounds and upward, $6.15 to $6.30 per cental, gross; *choice beeves*, fine, fat, well formed, from 3 to 5 years old and upward, averaging from 1,250 to 1,400 pounds, $5.75 to $6; *good beeves*, well fattened, finely formed steers, averaging from 1,100 to 1,300 pounds, $5 to $5.50; *medium grades*, steers in fair flesh, averaging 1,100 to 1,250 pounds, $4.50 to $4.75; *butcher's stock*, $2.75 to $4.50; *stock cattle*, $3 to $4; *inferior*, $1.75 to $2.50; *Texas cattle*, northern-fed, $2.75 to $3.50; *do.*, corn-fed, $3.75 to $4.50.

SAINT LOUIS: *Choice native blood steers*, $5.50 to $6 per cental; *prime second class do.*, 1,150 to 1,400 pounds, $4.50 to $5; good third class, $4 to $4.50; fair butcher's steers, $3.50 to $4; *choice corn-fattened Texans*, $4 to $4.50; *inferior to common do.*, $1.50 to $1.75; *milch cows*, $25 to $50 per head; *veal calves*, $6 to $10 per cental.

SHEEP.—NEW YORK: Supply limited and market good. *Fat lots*, $7 to $7.50 per cental; *extra*, $8 to $8.25; *poor*, $4.75 to $5.50; *average*, $5.56.

CINCINNATI: *Prime to extra*, $4.50 to $5 per cental, gross; *common to good*, $3.50 to $4; lambs, $4 to $6.

CHICAGO: *Common to choice*, $3.25 to $5.25.

SAINT LOUIS: *Extra to choice mutton grades*, $4.50 to $5 per cental, gross; *fair to good*, $3.25 to $4.25; *common to medium*, $2.75 to $3.

HOGS.—NEW YORK: Live hogs, $4.62½ to $4.87½ per cental; city-dressed, $5.25 to $6.50; western, $5.12½ to $5.62½.

CINCINNATI: *Good to prime lots*, $3.65 to $4 per cental, gross. Receipts light.

CHICAGO: *Extreme range*, $3.55 to $3.90 per cental, gross.

SAINT LOUIS: *Extra to choice*, $3.60 to $3.65 per cental, gross; *fair to good*, $3.30 to $3.50; *common to medium*, $3.25 to $3.35.

FOREIGN MARKETS.

WHEAT.—The weekly average prices of wheat in London during December, 1872, were, respectively, 56*s.*, 55*s.* 10*d.*, 56*s.* 3*d.*, 56*s.* 9*d.*, and 55*s.* 6*d.* per quarter, the aggregate sales being 252, 555 quarters. The standing quotations of the Mark Lane Express during the same time, were as follows: British white wheat, 50*s.* to 67*s.* per quarter; do. red, 50*s.* to 63*s.*; American, 58*s.* to 61*s.*; German, 59*s.* to 81*s.*; Russian, 47*s.* to 60*s.*; Danish and Holstein red, 60*s.* to 63*s.*; California, 65*s.*; Chilian white, 67*s.*; Australian, 64*s.* to 66*s.* In Liverpool American white ranged, with some fluctuations, between 13*s.* and 14*s.* 6*d.* per cental; do. red winter and southern, steady between 11*s.* 8*d.* and 12*s.* 2*d.*; do. No. 1 spring, 11*s.* 6*d.* to 12*s.* 2*d*; do. No. 2 spring, 11*s.* 3*d.* to 11*s.* 8*d.*; California white, 12*s.* to 13*s.* 8*d.*; Canadian white 13*s.* to 14*s.* 6*d.*;

do. red, 12*s.* to 12*s.* 7*d.*; Chilian white, 12*s.* to 12*s.* 6*d.*; French white, 12*s.* 3*d.* to 13*s.* 6*d.*; do. red, 11*s.* 4*d.* to 12*s.* 7*d.*; Spanish white, 12*s.* 4*d.* to 12*s.* 9*d.*; Danubian, 8*s.* to 9*s.* 10*d.*; Egyptian, 8*s.* to 11*s.* In Paris, during the first two weeks, the wheat trade tended downward, but the decline was arrested, and prices subsequently rose to what they were at the commencement—white wheat, 56*s.* to 58*s.* per quarter; red, 54*s.* to 55*s.* In England the weather was subject of chronic complaint among agriculturists, the intervals of fine weather being few and brief, while the unfavorable meteorological conditions were varied by storms and floods. But little wheat had been sown, and fears were entertained that even that would be rotted by the excessive moisture. This fear was also manifested on the continent, where the sowing was more successful. Yet foreign wheat was arriving in London in such quantities as to make it difficult to maintain standing rates. London averages were about 1*s.* below the country averages; hence the poor qualities of British wheat in that market.

FLOUR.—In London, British best town households flour stood uniformly at 50*s.* to 57*s.* per 280 pounds; country households, 43*s.* to 47*s.*; Norfolk and Suffolk, 40*s.* to 42*s.*; American flour, per barrel, 25*s.* to 28*s.*; extra and double extra, 30*s.* to 34*s.* Supplies of both native and foreign flour were good. At Liverpool, English and Irish superfines were quoted at 40*s.* to 46*s.*; do. extra, 43*s.* to 51*s.*; Trieste and Hungarian, 61*s.* to 75*s.*; Chilian and Californian, 44*s.* to 50*s.*; American, per barrel of 196 pounds, western, 28*s.* 6*d.* to 31*s.*; extra State, 29*s.* to 34*s.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.*; Canadian, 30*s.* to 34*s.* In Paris, during the period under consideration, the flour market exhibited a continued improvement, from, however, a depressed starting-point. The weekly range of prices for consumption for each week were, respectively, 41*s.* 9*d.* to 46*s.* 2*d.*; 42*s.* 3*d.* to 46*s.* 9*d.*; 42*s.* 11*d.* to 47*s.* 5*d.*; 43*s.* 6*d.* to 48*s.*; 43*s.* 6*d.* to 48*s.* per 280 pounds.

INDIAN CORN.—The standing quotations of the Mark Lane, London, market, during the month, were 32*s.* to 34*s.* per quarter for white corn, and 28*s.* to 29*s.* for yellow; Liverpool, per 480 pounds, American white, 31*s.* to 32*s.* 6*d.*; do. yellow, 29*s.* to 29*s.* 6*d.*; Trieste, 30*s.* to 31*s.*; Danubian, 29*s.* 6*d.* to 32*s.*

WOOL.—The market in London for English wool was firm and well maintained, though transactions were by no means large. Southdown hoggets were quoted at 1*s.* 9½*d.* to 1*s.* 11*d.* per pound; Southdown ewes and weathers, 1*s.* 8*d.* to 1*s.* 10*d.*; Leicester ewes and weathers, 1*s.* 11*d.* to 2*s.*; Kent fleeces, 1*s.* 10½*d.* to 2*s.* 0½*d.*

BUTTER.—The Mark Lane Express quotes English butter, in London, at the close of each week, as follows: Dorset, per cwt., 140*s.* to 144*s.*; 124*s.* to 140*s.*; 120*s.* to 140*s.*; 112*s.* to 140*s.* Friesland, 110*s.* to 130*s.*; 120*s.* to 130*s.*; 130*s.* to 134*s.*; 120*s.* to 132*s.*; 120*s.* to 130*s.* Jersey, 104*s.* to 112*s.*; 98*s.* to 112*s.*; 106*s.* to 120*s.*; 108*s.* to 124*s.*; 104*s.* to 120*s.*

CHEESE.—In London, Cheshire cheese ranged from 50*s.* to 84*s.* per cwt.; Double Gloucester, 58*s.* to 78*s.*; Cheddar, 64*s.* to 88*s.*; American, 50*s.* to 72*s.*

LIVE-STOCK.—At the great annual sale of fat stock for Christmas consumption, held at the Metropolitan Cattle-Market, in London, December 16, 1872, both the number and quality of the animals offered exceeded all expectation. Late rains had saturated the pastures, especially in the great northern cattle-raising counties and in Scotland, where the season was one of the most disastrous on record. Scotch hay was secured in an indifferent condition, while the root crops turned out poorly. The fine show of animal from those regions was, then, espe-

cially gratifying. Prime small breeds are becoming more plentiful and symmetrical, weight-carrying animals have largely superseded the massive, awkward beasts formerly so common. Foreign stock was also well represented, French graziers especially fully sustaining their former reputation. Continental breeders have made great improvements of late years, but have not kept pace with these English and Scotch competitors.

The comparative prices of farm animals at the last two "Christmas cattle markets" were as follows:

	1871.		1872.	
	s. d.	s. d.	s. d.	s. d.
Cattle:				
Coarse and inferior, per 8 pounds	3 10 to	4 6	3 8 to	4 0
Second quality, per 8 pounds	5 2 to	5 8	4 2 to	4 8
Prime large oxen, per 8 pounds	5 8 to	5 10	5 0 to	5 8
Prime Scots, per 8 pounds	6 0 to	6 2	5 10 to	6 0
Calves:				
Large coarse, per 8 pounds	4 0 to	5 0	5 0 to	5 6
Prime small, per 8 pounds	5 4 to	6 8	5 8 to	6 8
Sheep:				
Coarse and inferior, per 8 pounds	4 4 to	5 4	4 2 to	4 8
Second quality, per 8 pounds	5 6 to	6 4	4 10 to	5 6
Prime coarse-wooled, per 8 pounds	6 6 to	6 8	6 2 to	6 6
Prime Southdown, per 8 pounds	6 10 to	7 0	6 8 to	7 0
Hogs:				
Large, per 8 pounds	3 6 to	4 0	3 8 to	4 6
Neat, small porkers, per 8 pounds	4 0 to	4 8	4 8 to	5 0

Supplies:

	1871.	1872.
Cattle	6,320	7,560
Calves	41	340
Sheep and lambs	17,240	15,520
Pigs	70	100

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

MARCH, 1873.

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1873.

MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,
Statistical Division, March 13, 1873.

SIR: I herewith present for publication a digest of the returns of the March circular of the Statistical Division, showing the extent to which rotation is practiced in the country, and in what its courses consist; the methods of fertilization and soil amelioration practiced; hints of the relative profit of the different branches of farming, and the comparative practice of a restorative system; the comparative value of farm lands, and the causes of discouragement existing, and remedies proposed. Accompanying are reports of the work of other Divisions of the Department.

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

CONDITION OF AMERICAN AGRICULTURE.

It has seemed important to obtain facts showing the present status of our agriculture, especially with reference to such vital points as rotation, soil-improvement, and the present comparative profit of its principal crops. It was not expected that so large a subject could be treated exhaustively, but it seemed probable that the views and facts of the farmers themselves, presented in homely garb, might at least furnish a glimpse of the truth upon the great questions involved. The following list of queries elicited responses from regular correspondents of more than half the counties of the United States:

1. Is systematic rotation practiced by any portion of the farmers of your county? If so, what proportion of the whole number, of how many years does the course consist, of what crops, in what order, and with what preparation of soil for each?

2. With those whose practice cannot in any sense be described as a rotation, what crops are most grown, with what preparation, and how many years in succession is any crop cultivated?

3. What efforts toward soil-improvements are made? What fertilizers used, and to what extent—"commercial," barn-yard, or green-soiling? Is "clovering" practiced; and, if so, how, and to what extent?

4. What proportion of your farmers consume the larger portion of their field products upon the farm? Give illustrations, with accurate figures, of the comparative profit of *selling* and *feeding* hay and grain.

5. What branch of farming (as the growing of corn or wheat, the raising of stock, or production of wool or meat, dairying, fruit-growing, market-gardening, &c.) is at present deemed most profitable, and why?

6. Are farm-lands increasing or decreasing in value at present, and what is the average market-value of farms compared with their value in 1860?

7. What causes of discouragement exist among farmers, and what suggestions of remedies can you make? What form of co-operation or combination will aid in giving effect to such remedies?

SYSTEMATIC ROTATION OF CROPS.

A thorough system of crop-rotation is found in but few counties of New England, and in these the routine varies. The large number of towns and cities creates a demand for dairy and market-garden products which do not admit of any rotation. In some counties systematic rotation, and, in fact, systematic farming of any kind is pronounced "out of the question." Farming is here pursued upon too small a scale, or in subordination to some other calling, such as manufacturing, lumbering, &c. A tendency to indefinite repetition of the same crop is strongly developed in many localities. A few small farmers repeat corn and small grain, as they allege, with good results, but such cases are exceptional. Others plant potatoes every year. In Coos County, New Hampshire, India wheat is said to produce twenty successive good crops where the land has been annually manured. In Hampshire County, Massachusetts, tobacco has been raised for twenty years on the same land, highly fertilized. In Hartford County, Connecticut, this crop has been treated with domestic and commercial fertilizers to the amount of $200 to $300 per acre, securing returns of $600 to $1,200 per acre. In Rhode Island field-crops of onions are repeated from five to eight years, or until the smut destroys them.

The high prices of hay, averaging $25 per ton in the Boston market, keep a large area of land in grass. Very frequently the sod is broken up only at long intervals, either for reseeding in timothy or clover, or for a brief alternation of root or grain crops, to rest the land and prepare it for a new departure in grass-cropping. The period is lengthened by heavy annual top-dressing with barn-yard manure and plaster. In Newport County, Rhode Island, meadows are kept growing for ten or twelve years, by a liberal application of sea-weed every year. Here, however, the white worm, a larva of the May beetle, frequently destroys the grass in two or three years from seeding.

In some counties a three years' course—1. corn; 2. potatoes; 3. wheat—is practiced. In others corn is followed by small grain, and subsequently by several crops of grass, extending the course to 6 or 8 years, as in some localities in Rhode Island. The sod is sometimes top-dressed with manure before breaking for root or grain crops. Grass seed is commonly sown with small grain.

Systematic manuring is reported as the rule in three counties in Maine two in New Hampshire, one in Massachusetts, two in Rhode Island, and two in Connecticut. The periods range from three to ten years, Generally sod is broken for corn or potatoes, which are followed by small grain and then by grass for several years. In these counties cultivation is generally very thorough, the land being sometimes plowed to the depth of 6 inches and subsoiled 12 inches. Unprogressive farmers sharply criticise the subsoil process, but its results are stated to be very satisfactory, retaining the strength of the manure and saving subsequent cultivation.

In the Middle States systematic rotation is pursued to a greater extent and with more marked results than in any other part of the country, yet here special industries very largely interfere with the routine. About a third of the reported counties in New York pursue a regular and uniform system; another third pursue a partial rotation, while the remainder seem to ignore it entirely. The following remarks of our correspondent in Seneca will give some idea of the first class:

Comparatively few ignore rotation and practice slip-shod farming; that class soon drops out. Two general courses are pursued by intelligent farmers: the first is to

turn over a piece of clover or clover and timothy sod for corn; the next spring the field is plowed again and sown to oats or barley; in the fall the ground is again turned over and fitted for winter-wheat, receiving a top-dressing of barn-yard manure. The next spring the winter-wheat is seeded to clover or clover and timothy and allowed to remain in clover for one to three years, when the foregoing process is again repeated. The second course is to spread during the winter all the available manures made upon the farm on a piece of sod intended for corn; turn early and harrow thoroughly at proper time to plant to corn, then follows the rotation as practiced in the first case.

Near the large cities the market-garden system prevails, while in the rural districts large areas are devoted to dairying and cheese factories. In the latter the leading aim is to secure as large an amount of forage crops as possible.

Even in those countries where farming is intelligent and systematic, there still exists a class of so-called farmers, whose sole method is found in a merciless succession of the same crops, generally grain or root-crops, with shallow cultivation and little or no fertilization. This shiftless husbandry, however, is undermining its own existence, and promises shortly to relieve the country of its presence. As the soil finally refuses to answer this destructive system with a bare subsistence, the farmer sells out in order to "go west" and diffuse the blessings of his exhaustive system over a quarter-section of frontier virgin soil. In Delaware County, rye and buckwheat have been repeated through a whole decade. In Cattaraugus, five to seven successive crops of oats are raised year after year. In Chemung County, tobacco crops are raised, the leaf, it is said, growing finer and cleaner every year. On the cheaper highlands of the same county hay and oats have been raised till they would not bring a half crop. Onondaga County seems to have measureably got rid of this system, which left large areas covered with Canada thistle. In the valley of the Mohawk, crops of broom-corn have been raised for thirty years without any apparent exhaustion of the soil.

In New Jersey this class of farmers do not render themselves so prominent in our reports as in most of the other States. In a majority of the counties, reported rotation is pursued with greater or less regularity. The following summary by our correspondent in Cumberland County will give an idea of the extent and character of rotation in the State:

Our farmers are of two classes, grain farmers and truckers; the former class practice a five years' rotation; they first plow up their sward-land usually in the early spring for corn, applying some kind of fertilizer usually in the hill; after the hen-roost manure is exhausted, either phosphate or bone dust is used; the second year the same ground is either replanted in corn, or oats, or potatoes are put in, with a dressing of barn-yard manure, or for oats a light dressing of some commercial manure, and in the fall of the same year, wheat is usually sown in with another coat of manure, sowing down to grass and allowing it to lay two or three years, the grasses sown being usually clover or timothy. The truckers do not usually practice any routine, often putting in the same ground, year after year, and dressing heavily with manure.

The exceptions to rotation seem to be mostly the result of some great industry, such as market-gardening or dairying. Cultivation and fertilization are generally thorough. In Burlington County a considerable area in cranberry-marsh indicates the necessity of a constant succession in that peculiar product.

In Pennsylvania but three counties are reported as entirely ignoring rotation. In a large portion of the State the system is general if not universal. A routine known as the "Pennsylvania rotation" is especially noted in Cambria and other counties, which ranges through five years. Corn is planted on sod broken in the spring and thoroughly manured. Then follow oats, wheat, and two crops of grass, the wheat being treated with super-phosphates. The other systems reported are mostly modifications of the above. Our correspondent in Lehigh County develops

a transition phase of agriculture in Pennsylvania resulting from the extension of mining and manufacturing enterprise:

At present there is no particular system practiced by the farmers here. Especially in what is termed the Lehigh Valley farmers have suffered considerably owing to the iron business having forced wages to a point beyond which the farmer could not engage. A revolution in the system of farming has commenced which should have begun earlier. Owing to the short crop of wheat and rye for a number of years, low prices and high wages, farmers were almost ruined. The great number of hands required in the iron business made it apparent that more meat and vegetables should be produced, and which are also more remunerative. Our farming community is mainly composed of the old German element, who are slowly leaving an old-beaten path for a new untrodden one. A number of our farmers are confining their attention principally to corn, grass, and vegetable raising.

Market-gardening, grazing, and dairying largely interfere with rotation in different localities, but the class of shiftless, exhaustive farmers, though still too numerous, grows small by degrees.

In Maryland rotation is very general, though in some districts there is a decided tendency to excessive grain and grass cropping. The most general order is to begin with corn or potatoes on broken sod, and follow with one or two crops of small grain, the last being seeded with grass. Sometimes the last-named crop is continued till it runs out, and the rotation again begins. In Washington County, wheat, on good soils, is raised many years upon the same soil freely fertilized with bone, phosphates, &c. In Somerset, corn has been raised thirty years with little culture. The tendency to repeated croppings is found mostly among small farmers and tenants. Market-gardening and dairying are extensively pursued in some localities.

Of the South Atlantic Coast States, Virginia shows a considerable tendency to crop rotation. In several counties a regular system, formerly existing, was broken up by the disasters of the late civil war and the change in the labor system. About one-fourth of the counties report a somewhat regular routine, embracing: 1. corn; 2. wheat or oats; 3. clover; another fourth ignore it entirely, while in the remainder partial and dubious efforts are maintained. As a specimen of the first class the following, from Williamsburgh County, may be cited:

It is practiced by three-fourths of the farmers in this county. What is known as the three-field system is being adopted universally, almost, for the old four-field system. The second year after cultivation, with or without clover, a dark mold is formed in the soil, which will last only one year; and if the farmer fails to turn it in in the spring of the third year, he will almost certainly fail in a corn crop. In the following summer it is supposed the "acids arise," and then comes the sage-sod, which soon renders the soil very poor.

Our Nelson correspondent says:

One of the best farmers here has his farm divided into three fields, and works one every year, but turns under once always in three years a good crop of clover; this farm is improving rapidly in productiveness and the owner says he is making more money than before the war. Some prefer (on the five-shift system) corn, wheat, or oats, followed by three crops of clover, other produce in the order of wheat, corn, oats, and two crops of clover. For the first of these crops the farmers aim to turn the clover sod early in the fall and finish by what we call "fallowing for corn" by Christmas. Where clover sod is prepared for wheat a two or three horse turning-plow is used in July, August, and sometimes continued into September, when dry summers prevent early plowing. Where tobacco is cultivated it is almost invariably followed by wheat.

Henrico presents an example of the non-rotating counties:

The only pretense at rotation consists of corn first, then wheat or oats, followed by clover, which is left, usually, but a single year. If near a city, the clover is cut and sold in the market; at a greater distance from a market it is frequently turned under after having been pastured off or mown once. But little attention is paid to the land in any case. I have seen fields so wet when plowed for spring-oats that the water would accumulate in the furrows after the plowman.

The repetition of crops in long succession, without manure and with superficial culture, finds numerous illustrations in different parts of the State. In Princess Anne, corn has been grown for fifty years with an occasional crop of weeds as a rest. Near towns and cities this treatment is rendered more tolerable by the amount of stable-manure accessible; but in many places it has told severely upon the soil, as is thus stated by our correspondent in Cumberland County:

The best land is selected for tobacco and corn, following the tobacco with wheat, and some may sow a few clover seed to afford a scanty pasturage for their poor stock the next year. Others seed their corn-land year after year in oats, until they bring it to broom-straw, then go to their wood land for a fresh tobacco crop.

In North Carolina the majority of the counties reported indicate an entire absence of crop rotation. In other counties a partial and varying routine is noticed in rather dubious terms. The following is a specimen of the more systematic and intelligent but isolated efforts at rotation:

About half my cultivated land is not adapted for the growing of cotton; this half I reserve for corn and oats, not planting the whole of it to either crop, but a part to rest every year, and always following the rest with corn, and the corn with oats. I have divided the other half into two equal parts, one of which I plant to cotton, manuring with home-made compost or commercial fertilizer; on the other part I put a few acres in sweet potatoes, and remainder of the field in pease. The potatoes and pease are fed off on the land to hogs and beef cattle. The next year this part goes to cotton and the other to potatoes and pease.

Thus, in the cotton land the course is two years: 1. potatoes and pease; 2. cotton; in the remaining portion the course is three years: 1. corn; 2. oats; 3. rest.

The repetition of crops is pursued to an astonishing degree. In Catawba and Caldwell Counties, for instance, low lands have been planted in corn from seventy-five to one hundred years; in Pasquotank, fifty years; in many others from ten to forty years. In river-bottoms, where the soil is annually renewed and fertilized by overflow, this process seems capable of repetition *ad infinitum*. In some counties every agricultural interest is subordinated to cotton, which is grown year after year till the land refuses to yield a paying crop. In some instances cotton-fields are liberally manured, but in others very little effort is made to supply plant-food. Our correspondent in Stanly says:

The absence of market facilities, and the lack of cheap and improved implements of husbandry, prevent the poorer class of farmers from following a systematic rotation; and if the plan should be adopted by the wealthier class, it necessitates the farming out of their lands to colored laborers; who, though very industrious and well-behaved, cannot be brought to a perfected system in anything. Exhaustive cropping on the old plan is therefore the rule, and any attempt at a systematic course the exception.

In South Carolina, Georgia, Arkansas, and in all the Gulf States, systematic rotation is very little thought of. Our correspondent in Columbia County, Georgia, thus reflects a leading phase of popular opinion in the South:

Although the benefits following rotation are acknowledged by the majority of farmers in this section, yet it is practiced by comparatively few. Many think the extensive use of "commercial fertilizers" does away with the necessity for this annual change of crops, and the fertilizer used is selected with direct reference to the crop to be produced, and the crop is thus fed and grows by this outside help, *thus preventing too great a drain upon the soil itself*. This creates an idea in the minds of those who practice this system that the outlay of money is a salve to the soils, and to this extent not only preserves but increases its fertility; others maintain that this extensive and general use of stimulating manures, while they may and do increase the production, do it at the expense and the ultimate deterioration of the soil, in other words they "kill the land," and the old, worn-out lands of Virginia are cited in vindication of this theory.

Cotton, corn, small grain, sugar-cane, sweet-potatoes, and a few other crops are grown according to prospective local or general demand,

and often in exhausting succession upon the same land. Soil preparation and fertilization are often entirely ignored, and when practiced at all are very imperfectly attended to except in the case of cotton. Many counties report the repetition of this crop through twenty or twenty-five years, while in one—Wilcox, Alabama—lands have been kept fifty years in cotton without intermission. Occasionally this crop is alternated with corn, small grain, or grass. In some districts the soil appears to bear this strain with but little indications of exhaustion. In other cases, however, the normal results of this ruinous system are painfully apparent. In Louisiana new-comers occasionally attempt to introduce improvements, but are unable to resist the influence of universal example, and ultimately fall into the old routine. Some idea of this routine may be gathered from our report from Terrebonne Parish:

For the first year the land is put in corn and cane, it being too rich to put in solid cane; usually two rows of corn and two rows of cane are planted alternately; the corn ripens and is bent down before the cane gets very high, this admits the sun to the cane. The following year the two rows of corn are planted in cane, and all is thus kept in cane for two years more; then corn follows, and when it gets its last plowing a row of pease is sown on each side of the row, which covers the surface of the ground with a dense mass of vines; these vines are then turned under with four-mule plows, having revolving pea-vine cutters attached in front like a colter. Generally one year in corn and pease is sufficient to enable us to plant cane again. If the land is old, corn and pease are continued until the desired fertility is reached. The most approved plan is to keep old land two years in cane, *i. e.*, one year of plant and one of stubble, and then follow one year with corn and pease; this course steadily improves the land.

Among the special industries of this section of the Union, rice-culture is especially mentioned in Georgetown district, South Carolina. Two-thirds of the rice-lands have lain waste since the war.

In Tennessee, West Virginia, and Kentucky; though in the majority of the counties reported there is an entire absence of systematic rotation, yet in other counties it is practiced with considerable regularity and with excellent results. The rotation generally embraces corn, small grain, and grass, tobacco being sometimes interpolated in the series. In Robertson County, Tennessee, it is found that wheat follows clover more advantageously than corn. A three years' course commonly adopted is: first, corn; second, wheat; third, clover. This is changed to five years, as practiced by others: first, corn; second, wheat or other grain; third, clover three years. Others still practice a course of four years, with two years in clover.

In Monroe County, West Virginia:

Twenty per cent. of our people are tobacco-growers; they grow on new land generally two crops of tobacco, followed by wheat, which is considered a sure crop after tobacco; about one-third seed-clover on the wheat in the spring, and retain as permanent pasture, or turn over in two or three years for corn, and follow with wheat on corn-stubble.

In Oldham County, Kentucky:

About one-third practice rotation, the remainder plant corn in new timber-land so long as it will yield twenty bushels to the acre, then sow oats and repeat corn, and finally become so poor themselves they are compelled to sell the land and "go west." Another class, when the land has become impoverished, try clover for two years, then put in corn and follow by wheat or oats; this is what we term "four years' rotation;" about two-thirds follow this plan. Others, after corn, sow orchard-grass seed, one bushel to the acre, and one bushel of clover-seed to the eighth of an acre, with wheat or oats for two years, at the end of which time the clover has pretty well died out; the four following years cut for seed, which is one of the principal crops in this immediate neighborhood; this is termed the "eight-year system," *i. e.*, two grain crops, two years in pasture, and four years' cutting.

According to the practice of the best farmers in Fayette County, Kentucky:

Clover-sod is turned under in the fall or early spring, and two crops of hemp or

corn are made, then grain is sown in the fall or spring, clover (mixed with timothy or blue-grass where permanent pasture is desired) is sown upon the small grain, if designated for grain crops subsequently. After two full years' growth of clover, it is again plowed and small grain sown in the fall. Those who are yearly tenants have no system of rotation, but get all they can out of the land by cropping.

Injurious repetitions of corn and tobacco crops on bottom-lands and of small grain or hemp upon uplands are frequently mentioned.

Of the States north of the Ohio River, considerable portions of Michigan and Wisconsin have been settled too lately for the organization of any system of rotation or, indeed, for the introduction of any but ordinary methods of cultivation. Even here, however, the rudiments of a system of rotation are already discernible. In many of the older counties there is a more or less capricious shifting of crops, which some term rotation. In other counties however, regular systems are found extending through three to five years, and embracing corn, potatoes, small grain, and grass. In these States the temptation to repetition is mostly in small grain and potatoes; a temptation too frequently yielded to. Rotation is the general rule in about half the counties reporting from Ohio, while it is considerably diffused through many others. In the great river-bottoms fertilized by annual overflow the tendency to repeated crops is inveterate. Scioto bottoms, for-instance, after fifty years of repeated crops of corn, still yield 60 to 100 bushels per acre. The large proportion of this class of lands in the State greatly restricts the scope of rotation. Large areas are also devoted to grass-crops, stock-raising, and dairying, in which rotation is not practiced.

In Logan County—

About three-fifths of the cultivated land is under a varied system of five or six years' rotation. A three-year-old clover-lay is turned under in the spring and planted in corn; the corn-stubs are dragged down in the fall, and wheat drilled in the wheat-land being seeded to clover in the following February or March, making a five-year course of corn, winter wheat, succeeded by three years of clover; otherwise varied in a six-years' course by two crops of corn or wheat—the small amounts of oats, beans, potatoes, and buckwheat we grow making but an exceptional variation to the specified course.

In Morrow County, rotation is practiced—

By about one-half the farmers. Meadow or pasture land is plowed up in the spring, sometimes in the fall; when plowed in the latter season a more thorough harrowing is required. The most successful ones find it pays best to pulverize thoroughly previous to putting in the crop; the first and sometimes the second crop is corn, then follows oats, and next wheat. In preparing for oats, as soon as the top of the ground is dry enough in the spring, sow the oats on the corn-stubble, and put on a rolling-cutter or wheel-harrow. The crop is generally more certain than to wait until the ground is dry enough to plow; as soon as the oats are off give the land a deep plowing, from seven to nine inches, put on barn-yard manure on the poorest spots, from ten to twenty cords to the acre, and on the whole field, if there is manure; during September harrow the manure in with the soil, usually drilling is the most remunerative. This is the course usually followed with soil. Subsoiling and underdressing is but little practiced, although it pays to do it.

Rotation is the rule in about one third of the counties of Indiana; in another third it is the exception, while in the remainder it is unknown. Non-rotating farmers are found mostly in bottom-lands, but in too many cases the rich uplands have been ruined by their destructive practice. In Dearborn and Park Counties forty successive corn-crops have been gathered. The rotation series generally embraces corn or potatoes, small grain, and grass, though wheat frequently is sown upon fresh-broken sod. German farmers in Owen County practice a three-fold system of duplicate crops—two of corn, two of wheat, and two of clover. Of clover, the first crop is generally cut twice, once for hay and once for seed. The second crop is pastured till July, and then permitted to run to seed, after which it is turned under by deep plowing.

In Illinois nearly two-thirds of the counties reported ignore rotation *in toto*, while of the remainder at least half pay but little attention to it. Corn has been repeated for fifty years on alluvial bottoms, and wheat on uplands for twenty years. An annual decline of yield has been a significant but too often unheeded commentary upon this ruinous practice. Our correspondent in Cass County remarks:

Corn being our main crop, the only rotation is to either oats or wheat, the former producing a sure crop, the latter a very uncertain one. On land that has been under cultivation for a number of years, we raise two crops of corn and one of oats, thus making a rotation of three years; but one-half our best farmers keep about 50 per cent. of their land in pasture for seven years; it is then prepared for corn: a sod-plow drawn by two horses, followed by a subsoil plow drawn by two more, breaking the ground to a depth of six inches, completely covering up the sod; the ground is next well harrowed, check-rowed and planted. Ground thus prepared will yield from fifty to eighty bushels per acre, and will produce good crops for four years; then a crop of oats prepares it for two more crops of corn. The course thus described consists of seven years, four of corn, one of oats, and followed by two of corn again; then it is ready to be sown in grass again, which is done by putting in timothy and clover; about February and 1st March, broadcast, on land where corn grew the previous year.

In the States west of the Mississippi the same general facts are observed. Rotation is almost unknown in three-fourths of the reported counties of Minnesota, in seven-eighths of those of Iowa, and in two-thirds of those of Missouri, while in Kansas and Nebraska it is but little more than nominal. Destructive repetitions of particular crops are too frequent to particularize. In Bremer County, Iowa—

The great majority of farmers break up the prairie sod in June if possible: it is sown to wheat the following spring, generally with a broadcast seeder, and then well harrowed; some few cross-plow in the fall, the same season it is broken; others plow the same direction it was broken and turn the furrows back. Wheat is usually grown upon this land two seasons in succession, and sometimes longer. Stubble-land of wheat and oats is almost invariably plowed in the fall. The land is afterward cultivated alternately with corn and wheat or oats. Occasionally a piece is seeded with timothy or clover, or both, and mown for hay, or pastured for a year or two, and sometimes longer, then plowed up and sown with wheat.

One of our correspondents in Missouri writes:

The farmers of this section mainly belong to that well-known class yclept "old fogies," whose ancestors, hearing of this goodly land about half a century ago, came hither from Kentucky and Western Tennessee, literally following the leadings of Divine Providence, upon whom they relied with unfaltering faith for support, doing as little as possible themselves to interfere with the Divine arrangements.

Our correspondent in Nemaha County, Kansas, says:

I came here in 1860 from New York, where I had farmed land worth $100 per acre, following a systematic rotation with good results. I commenced nearly the same course on our new prairie soil, excepting the manure and clover. I alternated corn and small grain, but found it would not answer; corn will not do well after small grain. I then adopted the plan of corn for two seasons, then summer-fallow; then spring grain, followed by winter grain; then summer-fallow again, and follow with corn.

In three or four counties of Utah there are rotations of corn, small grain, and pease, but the order is not very uniform. In no other portions of the Territories have any approximations toward rotation been reported.

On the Pacific coast rotation is but little known. In California, where the great staple wheat crop has been grown in destructive succession, it is becoming common in some localities to vary the crop every few years, either with a volunteer crop of wheat-hay, or by seeding in barley, oats, or corn. The increasing growth of weeds and the constant multiplication of foul seed is compelling some alternation of crops. In some counties, Humboldt for example, new land is planted from two to five years in potatoes, followed by several years of wheat, and finally by grass crops, which are sometimes continued till they run

out. The best wheat-lands, which have astonished the world by their enormous production, are visibly declining in fertility.

In Oregon, only two counties report even an approximate system of rotation. The abundance of land owned by individual farmers enables them to rest the soil, yet there are instances of long succession of crops. In Linn County a thirteenth wheat crop (Australian spring) averaged 26¼ bushels per acre. The cultivation in this case was thorough, embracing two plowings, the first 10 or 12 inches and the second 6 inches. Very few of these repeated crops, however, have received any such cultivation as is seen in the declining fertility of some of the finest wheat-lands.

SOIL IMPROVEMENT.

In many counties of New England efforts for the permanent improvement of the soil are intelligent and energetic. In others, however, but little is done except with reference to immediate results. Many farmers are more or less dependent on manufacturing, lumbering, fishing, or some other outside calling for a living, and consequently give but minor attention to the cultivation of the soil. Others own but a few acres, and are destitute of the capital necessary to make improvements or even to arrest the deterioration of their lands. Hence from some quarters come complaints of declining fertility. But the necessity and the practicability of retaining and even of enhancing the natural fertility of the soil have lately awakened more general attention and have led to some systematic and well directed enterprise in this direction.

Barn-yard manure is universally used. The accumulations of the stables and vaults of the numerous cities and manufacturing towns, after supplying the market gardeners and truck-farmers in their immediate neighborhood, are in some cases transported hundreds of miles into the interior by river and rail. This long transportation, however, renders the material too costly for extensive employment in general farming. On the farms it is sometimes saved with extreme care, while in many cases it is to a great extent wasted. Among the best-farmers, in all this region, barns have been constructed with especial reference to the saving of both solid and liquid excrements of farm animals. These are composted with muck, sawdust or any other material that will absorb ammonia. The droppings of the hog-pen and of the hen-roost are, by many farmers, carefully gathered and added to the barn-yard heap. Night-soil is used near the cities. Sometimes these fertilizers are plowed under for the corn crop; sometimes they are applied as a top-dressing, especially upon grass crops. Near the coast large quantities of lobster-refuse, menhaden, and other fish manures are used. On some soils they produce valuable results, but upon others their application has not been so satisfactory. Sea-weed, salt-marsh hay, and other vegetable *débris* are eagerly sought after. Commercial fertilizers are extensively used in a few localities, but in others they have lost favor. Nova Scotia plaster is a great favorite in Chittenden County, Vermont. In several localities in Massachusetts, Rhode Island, and Connecticut, guano and superphosphates are extensively employed. The tobacco-growers of Hartford, Connecticut, especially favor concentrated fertilizers and claim very remunerative results from their use. "Fancy farmers, gardners, and fruit-growers, with city business," also use them extensively, but it is intimated that in many cases the expense overruns the profits. Green-soiling and clovering are but little used. Our correspondent in Carroll County, New Hampshire, censures the plowing under of green crops upon the following grounds:

1st. One year's rent of the land is lost. 2d. The cost of seed and labor would procure and apply compost-manure enough to insure a better crop the present season, and benefit the land for a longer time than any crop raised on the ground without manure, and plowed in, will insure the next season. It is a fact that compost-manures will get their reward one year sooner than a turned-under green crop. For an illustration: Farmer D's land is naturally good, but it has run out by poor management; he adopts the green-crop fertilizing principle and expends, in seed, labor, &c., $200, and puts his whole crop under the soil, and the income is *nil:* thus the farm stands Dr. to cash and interest, $230. Now, Farmer K expends on his land $200, in compost and labor, and the result is, he obtains a crop worth $230, and the following spring his account will stand thus: Farm, Dr. to cash and interest, $230. Farm, Cr. by crops, $230.

Considerable underdraining and subsoiling are reported in some localities. In York County, Maine, underdraining is confined mostly to clay lands, and is not gaining favor. Farmers here contend that it is not necessary in hill lands. The genial effects of improved cultivation are especially remarkable in many counties. In some localities a feeling is gaining ground in favor of more systematic rotation. In Kent County, Rhode Island, it appears to be demonstrated, "whether from upwards of two hundred years of successive croppings or original lack of organic properties in the soil," "that no amount of manuring will keep the soil in profitable tilth beyond the seventh year."

In the Middle States farming is more an exclusive pursuit than in New England, and is pursued in many counties with intelligent reference to soil-improvement. This, however, is not always observable in those counties in which rotation of crops is most generally observed. Fertilization as well as cultivation are too often directed to immediate and superficial results, regardless of subsequent impoverishment of the soil. Domestic fertilizers are used by all farmers, and in general are economically treated. The towns and cities supply a very large fund for the supply of market-gardeners and-truck farmers, but the chief resource of the general farmer is in the accumulations of his own farm. Stock-raising and sheep-husbandry add very considerably to the amount of organic matter returned to the soil for plant-food. In New Jersey extensive deposits of marl are found in accessible positions, and are freely used as fertilizers. Lime, also, is a favorite in counties where it is readily obtainable, especially in those regions of Pennsylvania which are underlaid by extensive coal and lime-stone strata. Fish manure, sea-weed, and other marine organic matter are largely used near the coast, and night-soil, well composted, is in demand among market-gardeners. Commercial fertilizers are growing in favor in some counties, while in others their value is seriously questioned. Clovering and green-soiling are, in many counties, the mainstay of recuperative farming. The green crops, heavily top-dressed with either barn-yard manure or plaster, are often inverted in full and luxuriant growth; even buckwheat is treated in this way, though the practice is sometimes sharply criticised by intelligent farmers. The high prices of hay tempt the farmer either to mow or pasture his grass crops too closely, thus limiting the benefit that might be derived from this process. Lawrence County, Pennsylvania, especially relies on clover as a fertilizer and raises unusual quantities of clover-seed for market. Underdraining, subsoiling, and improved tillage are cited as effective agencies in soil-improvement. The results of systematic efforts in this direction are especially seen in Monmouth County, New Jersey, the soil of which, though remarkably poor forty-four years ago, has become very rich and productive. The same might be said of many other counties in the Middle States, but marked examples of a contrary character are not wanting.

Of the South Atlantic coast States, Maryland and Virginia practice an agriculture more assimilated to northern than southern systems. In

the former, which measurably escaped the devastations of the late civil war, farming appears of late to be prosecuted with greater energy and success, and to have embraced within its scope a more earnest effort for the permanent improvement of the soil. Special efforts in this direction are reported in Frederick, Caroline, and Howard Counties. Barn-yard manure is the special reliance in such movements, but lime is of very frequent application. Wicomico County uses about 100,000 bushels per annum; Frederick spreads 40 or 50 bushels of lime per acre. In Queen Anne it is applied in moderate quantities to clover before plowing for corn, and then 300 pounds of superphosphates per acre are placed on corn-ground to be plowed for wheat. This application, it is said, will double the wheat crop and treble or quadruple the subsequent clover crop, besides leaving the ground in better condition for subsequent tillage, while the use of only 100 pounds of superphosphates would do a positive injury by causing the crop to run to straw. Commercial fertilizers, however, are generally less used. Clovering is considerably practiced in the western counties.

In Virginia the majority of our reports show little or no effort for soil-improvement. The waste of the late war and the change in the labor system are alleged as the reasons of this backwardness. This, however, is not universally the case. In Cumberland County, "within the last two years considerable advance has been made in the improvement of lands owing to the increased circulation of agricultural works and the dissemination of better varieties of seed." Intelligent farmers in Rockingham are making strenuous efforts, saving manure, composting, clovering, &c. In Williamsburgh County—

> Great efforts were made by farmers, followed by many and disastrous failures, in their attempts to improve their lands with the modern quack fertilizers; finally they have determined to use nothing but lime and the farm products, and which we consider the only salvation of the farming interests of this county.

Experiments in clovering have been quite unsuccessful lately on account of the extreme drought. Commercial fertilizers have greatly disappointed expectations, but lime has produced very favorable results. In North Carolina some isolated efforts are made by intelligent men to improve their lands, but generally the idea itself is entertained by few. As an excuse for inaction it is alleged in some quarters that crops are seldom housed till after Christmas, and that the weather after that period is too cold for out-door labor. This from the latitude of North Carolina will sound oddly to northern and western farmers, who find time for extensive and important farm labors during each winter. In South Carolina the phosphates, of which large deposits have been found in that State, are extensively applied, but not always with intelligent reference to their specific effects. These applications are mostly made for immediate results and not for permanent improvement, which appears to be but little regarded. Georgia makes an extensive use of commercial fertilizers upon cotton. Gwinnett County consumed about 2,000 tons during 1872. In Franklin County they have been applied at rates varying from 300 to 1,000 pounds per acre. In a few counties, such as Gordon, clover is raised in increasing quantities, and in some cases has been plowed under in full growth. Of the lands within ten miles of railroads in this county about 25 per cent. are in clover. The difficulties of recuperative farming are thus stated by a correspondent in Talbot County:

> Nothing is regarded by farmers so profitable as cotton. The lands generally produce such small crops of corn that it will not pay the expense of the laborers we are obliged to employ, owing to the fact of their having but little regard for loss of time, even

when they are interested in the crop; moreover, an acre of land that will produce 8 bushels of corn will produce 125 pounds of lint-cotton, which of course is much more profitable.

The following, from Gadsden County, Florida, presents the case of that State in a nutshell:

The efforts in this county are rare and feeble. A few are impressed with the importance of the subject, and are making some efforts in the proper direction, but the great majority of planters have ignored it entirely. Under the present system the land is either rented to the laborer annually for a specified sum per acre, or he receives as compensation for his services a share of the crop produced; in either case his interest ceases with the housing of the crop.

In Alabama, Mississippi, and Louisiana, efforts at soil-improvement are but little more than nominal. In some cases farmers working their own lands haul manure, but neither the large planter nor the tenant-cultivator thinks of such an extra exertion. A few experiments in subsoiling and deep plowing are disparagingly spoken of. In Texas, in some localities, soil-improvement is considered a proper subject of amusement. In all of these States, where any effort is made to utilize barn-yard manures, the purpose of saving labor is everywhere prominent. Occasionally a truck-patch or garden is manured by "cow-penning," or confining farm animals within an inclosure, in order that the soil may receive the benefit of their droppings without the labor of hauling. Cotton-seed and commercial fertilizers are used largely for stimulating the growth of cotton. In Arkansas there is manifest a greater interest in this subject, and efforts, though partial and feeble, show an appreciable difference from the other cotton States. Very considerable efforts are made by a portion of the farmers of Tennessee to improve their soils. Clovering is the main stay in a part of the State. Our correspondent in Knox County gives the following:

But few fertilizers are used, and not much barn-yard manure. Farmers rely chiefly on clover and plaster, and the result is astonishing to northern farmers. After our lands have become so exhausted that five bushels of wheat to the acre cannot be counted on with certainty, by the sowing of clover, or clover and timothy, and using one bushel of plaster per acre for three years consecutively, the land will yield from fifteen to twenty bushels of wheat with almost an absolute certainty; and during the three years in clover will yield from one and a half to two tons of hay per acre; and if again sown in clover and timothy, and allowed to remain two years, will be restored to its original productiveness. During the past five years the hay and clover-seed will net the farmer more clear profit than any other crop he can grow, aside from the improvement of the land.

Green-soiling is but little practiced. Grasshoppers have deterred the raising of fertilizing crops in some cases. Some counties report great improvements in the last five years, but the general indications are that public attention, as yet, is but little awakened to the subject.

In West Virginia and Kentucky general efforts at soil-improvement appear to be wanting, yet there is, in many counties, a growing attention to the subject. Clovering has not been so successful during the past two seasons, on account of drought, but it is largely used in some counties, though often too closely cut or grazed to be of signal value. Live stock, and especially sheep, are increasing in numbers, enhancing the productiveness of the soil. Manuring is practiced with greater care, but still it is too much neglected or confined to "poor spots." In Boyle County, Kentucky, four-fifths of this material is wasted. In Pocahontas County, West Virginia, there is "very little effort toward soil-improvements; barn-yard manure is not economized, while limestone and lumber lie moldering side by side." Our correspondent in Daviess County, Kentucky, says:

Within the last few years the people are beginning to awake to the value of fertilizers. Much waste land has been reclaimed by their influence, such as red clover, red-

top or herd grass, or barn-yard manure. Clovering is practiced by almost every farmer to a considerable extent, but not half enough.

Our reports from the States north of the Ohio present a remarkably variable character. In Ohio the use of barn-yard manure is generally among upland farmers, though there are conspicuous examples of its neglect even among them. The large area in bottom-lands is fertilized to a very moderate extent, and often not at all. Clovering is a leading idea in some counties; in Logan 40 per cent. of the farmers use plaster to stimulate its growth. Ditch and tile draining and subsoiling are largely practiced, and stock-raising, especially sheep-husbandry, is increasing. The following from Richland County represents the methods of a large portion of the State:

Of late deep plowing is more practiced than formerly, so deep as to find a new farm which lay under the old one, which latter is quite as valuable, if not of greater value, than the old one. This is assisted with all the manure on the farm. This course is the general one; some purchase large quantities in villages and cities. Green-soiling is practiced to some extent. At present prices, it is unprofitable to buy "commercial fertilizers" for the production of our common cereals. At the prices asked for such fertilizers, the expenditure is greater than the income. Those who formerly practiced this method have returned to the barn-yard again. For corn, we think a compost from the pigeon and hen roost, with plaster, is attended with quite as good results as are "commercial fertilizers." This is usually applied in the hill, sometimes upon and sometimes under the seed; some have placed it upon the hill after planting, but with precarious results. This compost is needed for the early nourishment of the tender plant upon its first appearance above the ground, and for the first three or four weeks afterward; it is especially needed at that time, whatever may be its effect afterward, which is no doubt beneficial; but for the maturation of the plant we depend upon the decomposed manure and seed turned under. Clovering is very generally practiced with us; our rolling and hilly lands are welladapted to its growth or culture. First crop for hay, and the aftermath for seed generally, but sometimes for hay also; then, again, others prefer the aftermath for pasturage, leaving the refuse upon the soil, which is not exhaustive to it, while both the others certainly are.

Our correspondent in Kalamazoo County, Michigan, says:

Gypsum is the only commercial fertilizer used, and that not uniformly or generally by the mass of farmers. Of late years barn-yard manure is appreciated enough, so that if farmers have time after everything else is done they will draw it into the field. But a few years since the accumulation of manure around the barn was considered a great nuisance, and many barns have been moved to new ground to get away from the evil. "Clovering," so called, is practiced to a large extent in the growing of wheat. The land is left fallow until about the middle of June, when the clover and the other vegetation is turned under by a plow especially adapted to this purpose. It is afterward worked thoroughly with a two-horse cultivator previous to seeding, which is done with a seeder and cultivator combined. Where this plan is followed results are uniformly satisfactory. Without it, I incline to the opinion that the wheat crop of this State would be fearfully diminished. One fact has been demonstrated that is important to know, and that is, *that the increase of yield per acre is almost in exact ratio to the amount of cultivation.*

In many portions of Michigan very great efforts are made for the permanent improvement of the soil.

In about one-fourth of the counties of Indiana, as reported, recuperative enterprise is very backward, if it has any existence at all. In about one-half there are indications of an awakening to the necessity of soil-improvement; while in the remaining fourth the movement is promising and growing. In some counties only one-half or one-fourth of the farmers haul manure, very often merely to get it out of their way. More care is now manifest in saving and applying it. Clovering and green-soiling are reported in some quarters, as are also subsoiling and ditching. Commercial fertilizers are of limited use. Improved methods of culture have also exercised a beneficial influence.

Our correspondent in Crawford County, Illinois, says:

As our lands are reduced by cultivation and so much increased in price that they cannot buy a new field cheaper than improve an old one, our farmers are paying much more attention to fertilizers.

The above remarks indicate a satisfactory reason for the long continuance of the exhaustive process of culture upon the rich lands of the Northwest. Economic considerations of immediate weight and bearing are now pleading for a recuperative system, and it is scarcely possible that such should plead in vain. The use of barn-yard manure has become quite general. The burning of straw and other residual organic matter is less frequent than formerly. Clovering, green-soiling, trench-plowing, subsoiling, and other improvements have been extensively introduced.

The rich soils of the new counties of Wisconsin have, as yet, given but little uneasiness to farmers in regard to an ultimate but inevitable exhaustion, but in the older portions of the State this question has assumed a practical aspect. Some intelligent and successful efforts have been made to maintain the productiveness of lands by a careful saving of domestic fertilizers, by stock-feeding, and by improved processes of culture. Many aggravated cases of a contrary character, however, are reported.

West of the Mississippi the farming of a very large number of counties is thus graphically described by our correspondent in Linn County, Iowa:

> No efforts are made toward the improvement of the soil, but on the contrary the most strenuous efforts to impoverish it by getting from it all that can be got and giving nothing in return. Barn-yard manure, if it can so be called, only is used.

Systematic soil-improvement is merely nominal in from one-half to three-fourths of the counties reported, yet there are isolated cases of the most advanced and intelligent effort. Between these extremes there is a wide range of effort, which on the whole gives promise of improvement. The exhaustion of some of the richest lands in the older portions of these States has challenged attention to a growing necessity for recuperative culture, and hence domestic fertilizers are coming into more general use. Commercial fertilizers are occasionally tried, but with no remarkable results. Clovering is increasing, while subsoiling and other improved processes are becoming more frequent. Our correspondence abounds in severe strictures upon the general status of farming in these States. In the Territories farming is too new and unsettled, and the virgin soil too recently brought under cultivation to secure any attention to this matter.

On the Pacific coast summer-fallowing and irrigation are the leading methods of soil recuperation. The dry summers render it difficult to rot manure sufficiently to render it serviceable in fertilization. What little is made is in many cases absorbed by the garden or truck-patch, leaving but little for field crops. In Placer County, California, it is estimated that summer-fallowing increases the subsequent wheat-yield at least 20 per cent. In Linn County, Oregon, grain is cut with "headers" which leave most of the straw on the ground. This is plowed under and forms a very good fertilizer. The large area of land owned by individual farmers admits of frequent and continued resting from cropping.

THE PROFITABLE AND RESTORATIVE IN OUR AGRICULTURE.

The questions in our March circular, numbered four, five and six, were designed to elicit facts showing the comparative prevalence of "restorative" farming, (any system by which the farm annually becomes more productive by the return of an equivalent for that which

facturing, increase of transportation facilities and an effort for improvement. The decline in prices of farm produce, and the various discouragements complained of in the West, have had some effect upon prices there.

The following table shows the comparison between 1860 and 1868, as reported in the former investigation:

States.	Increase, per cent.	Decrease, per cent.	States.	Increase, per cent.	Decrease, per cent.
Maine	19		Mississippi		65
New Hampshire	17		Louisiana		70
Vermont	17		Texas		28
Massachusetts	17		Arkansas		55
Rhode Island	18		Tennessee		18
Connecticut	20		West Virginia	32	
New York	28		Kentucky	10	
New Jersey	30		Missouri	32	
Pennsylvania	25		Illinois	42	
Delaware	66		Indiana	27	
Maryland	20		Ohio	32	
Virginia		27	Michigan	70	
North Carolina		50	Wisconsin	50	
South Carolina		60	Minnesota	100	
Georgia		55	Iowa	75	
Florida		55	Kansas	150	
Alabama		60	Nebraska	175	

The returns upon this portion of our circular for March were not complete, and the attempt to establish State averages is therefore less satisfactory, yet the results of such generalization harmonize substantially with the averages of 1868, allowances being made for the modifying influences at work upon prices in the different sections. These are not given as *State averages*, but averages of the counties reported in comparison with 1860.

States.	No. of counties reporting.	Increase.	Decrease.	States.	No. of counties reporting.	Increase.	Decrease.
		Per cent.	Per cent.			Per cent.	Per cent.
Maine	3		13	Texas	38	50	
New Hampshire	4		11	Arkansas	13	20	
Vermont	7	23.		Tennessee	35	5	
Massachusetts	5	8.		West Virginia	18	20.	
Connecticut	2	13.		Kentucky	28	5	
New York	28	34.		Ohio	40	30	
New Jersey	6	28.		Michigan	24	60	
Pennsylvania	30	32.		Indiana	43	26	
Delaware				Illinois	44	37	
Maryland	8		17	Wisconsin	22	44	
Virginia	41		25	Minnesota	23	85	
North Carolina	34		17	Iowa	40	70	
South Carolina	7		38	Missouri	44	26	
Georgia	38		15	Kansas	19	175	
Florida	7		47	Nebraska	6	175	
Alabama	22		42	California	13	10	
Mississippi	25		44	Oregon	5	45	
Louisiana	12		29	Utah Territory	3	73	

A few extracts, which exhibit something suggestive as to prices and the cause of change in rates, are appended:

MAINE.—*Androscoggin:* Value has increased to some extent in the vicinity of villages. *Piscataquis:* Farm-lands are increasing owing to the lumber manufacturing and opening of a railroad through the county.

VERMONT.—*Windham:* On the line of railroad the farms are increasing in value, while at more remote points from market the price is decreasing.

MASSACHUSETTS.—*Middlesex:* Suburban lands increase in value from the influence of increasing population. *Bristol:* Farm-lands in the immediate vicinity of cities are worth at the present time double their price ten years ago. *Berkshire:* Farm-lands are higher than in 1860; but not so high as in 1865.

RHODE ISLAND.—*Washington:* Farm-lands have steadily increased in value along the shore, while those a few miles distant have as steadily and perhaps more rapidly decreased. Shore-farms are worth 25 to 45 per cent. more at present than in 1860—remote lands remain about the same.

NEW YORK.—*Chenango:* Farm-lands are not selling as high as they were two years ago. *Ontario:* Lands are firm with an upward tendency. *Monroe:* Average price about $100 per acre, small places much higher. *Livingston:* Farm-lands are improving in value at the present time; not much higher than in 1860. Good farms in this county are worth $100 per acre; those near railroad-stations often sell for $200 per acre. *Rensselaer:* Farm-lands are increasing in value from 25 to 100 per cent., and more in some cases. *Jefferson:* Farms can be bought 10 per cent. less than two or three years ago. *Ulster:* Land in this county has doubled in value since 1860 on account of our good markets—caused by manufactures, working quarries, and building railroads through the county. *Montgomery:* Farm-lands are decreasing in value at present. *Otsego:* Owing to falling prices farm-lands are not as ready of sale or at as high a price as two or three years ago. *Madison:* The value of lands compared with 1860 is about $10 per acre higher.

NEW JERSEY.—*Bergen:* Farming lands for *farming purposes*, all things considered, are worth no more to-day than they were in 1860. *Warren:* Farm-lands have advanced since 1860; from 1860 to 1869 they advanced 80 per cent., and have now fallen back about 40 per cent. *Hunterdon:* Farms are worth about as much in currency as they were in 1860; lands are going down both in fertility and value.

PENNSYLVANIA.—*Clearfield:* Timber-lands have increased in value at least 300 per cent. since 1860. *Washington:* Farm-lands are increasing in value slowly and steadily by reason of improvements, both public and private. *Mercer:* Farm lands are increasing in value. The causes of rise are large manufactories of iron, and large export of coal, and the facilities of five railroads traversing the county. *Fulton:* The best of farms here that could have been bought in 1860 for $40 or $50 per acre, would bring now from $75 to $100; the poorer farms that could then have been bought for $10 to $15 per acre, would now bring $25 or $30. *Indiana:* Land ranges here from $15 to $60 per acre; rough timber-land has advanced more than 50 per cent.

VIRGINIA.—*Spottsylvania:* The price has fallen 50 per cent. since 1860. The farmers are anxious to sell their surplus land, and will give a cordial welcome to all who may wish to settle among them. *Chesterfield:* Increasing; our cheap lands, which have been so long overlooked, are beginning to be appreciated, with a little disposition to advance in the middle and northern portions of the county, especially along the lines of the three railroads running through it, and more especially near and in the growing town of Manchester. *Roanoke:* Our best farm-lands are increasing in value, while thin lands are decreasing in about the same ratio. *Nelson:* Decreasing; from 20 to 50 per cent. less. Very poor lands can scarcely be sold at any price; where the fertility of the land has been maintained and the buildings and fences kept in repair the reduction in price is much less. *Nansemond:* For truck-lands, increased; for farm-lands, very much diminished since 1860. *Powhatan:* Lands have been sold in the county, recently, at $3 to $10 per acre, and there are numbers of farms for sale which could be purchased at those figures.

NORTH CAROLINA.—*Warren:* Lands immediately on the railroad have advanced, probably, to their price in 1860, on account of immigration; but those removed from the railroad are not in demand. There are not less than 50,000 acres in the county for sale. *Jones:* Lands adapted to cotton have increased in value at least 25 per cent., and some as much as 50 per cent; while lands not adapted to cotton, but only to grain, have decreased in a corresponding ratio. *Burke:* Good farms of from 200 to 500 acres can be bought at from $1,000 to $5000. *Pasquotank:* Increasing. Because of the large number of farmers who have emigrated from Pennsylvania and New York to this county in the last three years, (they now own one-fifth of the land and pay one-fourth of the taxes,) land has advanced in price very much. It is not generally as high as in 1860; but in some instances, near town, it is much higher than ever before. *Bertie:* The lands that are cultivated regularly are improving in quality, but decreasing in quantity. The large farms, say of 1,000 acres and upward, have decreased in value since 1860 about 50 per cent., except those on the water-courses, the value of which remains about the same. *Cumberland:* Increasing; worth about as much now as in 1860; from $7 to $20 per acre, half cash and one or two years time on the balance.

SOUTH CAROLINA.—*Union:* Farm-lands were higher before the war than at present, but are gradually increasing in value. *Darlington:* Improved places are worth $8 per acre; unimproved, $4 per acre. *Marion:* The average value is about the same as in

1860, though not nearly so uniform. Well-improved lands sell higher than in 1860, while poor, unimproved, sell cheaper.

GEORGIA.—*Hart:* Good farms, since 1865, have, in many instances, doubled their value. Poor lands, thousands of acres of which are turned out, have not increased much in value since that time. *Marion:* In 1860 farm-lands were worth from $10 to $20 per acre; at present, from $7 to $15. *Forsythe:* Worth 60 per cent. more than in 1860, and 25 per cent. more than four years ago, and still are low, ranging from $2 to $20 per acre. *Brooks:* Lands that sold freely, in 1860, at $20 per acre, are upon the market now in large quantities, at low prices, say $3 to $5 per acre. *Wilkes:* Certainly decreasing in *real* value, and, under the present system, their becoming entirely worn out and worthless is only a question of time. From tightness in money matters, mostly, lands generally will not command as good prices as two or three years ago; but within a few miles of town or railroad communications, they are much higher than in 1860. *Franklin:* Farm-lands worth $10 per acre; wild lands, $1 to $3. *Douglas:* Increasing; 20 per cent. higher than 1860; but timber-lands 20 per cent. cheaper. *Effingham:* Not improving in value; worth from $1 to $3 per acre. *Cobb:* Increasing; average value equal to that of 1860, or $10 per acre. In some cases land that sold in 1867 and 1868 for $5 per acre would now sell for $20. *Barton:* Increasing; notwithstanding the ravages of war and consequent impoverishing of our people, their lands are all 10 per cent. higher than in 1860, and very much higher than in 1866. *Gwinnett:* Increasing rapidly; one-third higher. *Carroll:* Increasing on account of new railroads running through the county; 100 per cent. more valuable than in 1860. *Pickens:* Have decreased in value, uplands at least 100 per cent. compared with 1860. Know of nothing that will remedy us except a railroad. We have one of the finest counties in the State, abounding in iron ore, marble, and inexhaustible, never-failing water-power. All we need is to have our resources developed.

FLORIDA.—*Madison:* Have decreased in value astonishingly. Plantations which in 1860 sold for $10 to $15 per acre could not now be sold for $5; indeed there is no demand. A man will pay for the rent of an acre for one year more than he will agree to give per acre for the whole farm. Lands worth in 1860 $5 to $10 per acre are now a "drug" in the market at $1 to $2 per acre. *Hamilton:* A farm valued in 1860 at $5,000 would not sell now for $500. There has been no immigration to this county, and there are none to buy; yet we have as good lands as can be found in the State, and far better than some counties in which lands are valued at much higher figures than ours, because there happens to be some immigration.

ALABAMA.—*Conecuh:* About as low as they can get. Lands that would sell for $10 to $15 per acre in 1860 will not sell now for more than $3 per acre. Good lands can be purchased cheaper in this county than in any other place in the Union. Causes: taxes, emigration to Texas, and want of money. *Dallas:* Many farms here can now be purchased for $5 per acre that could not have been bought for $30 per acre in 1860. *Macon:* The average market-price is now about $3 per acre; in 1860, $8 per acre. *Perry:* Farms worth $30 to $50 per acre in 1850 are now worth $5 to $10. *Clarke:* Have decreased; average price about $5 per acre. *Wilcox:* Nearly valueless. There is really no market-value. Well-improved plantations can be had from $5 to $10 per acre. *Lauderdale:* Had increased in value since the depressed prices of 1865 and 1866 up to 1870. Many northern farmers had come in, bought, and made a demand, and land went up. But they have nearly all failed to succeed with the labor, and many of them have left, and there being no demand land is down. There is a German settlement forming, and as they use their own labor, and buy cheap lands and manure, we hope they will succeed. The best improved river places, with bottom-lands in part, are rated about $25 per acre; uplands, with good improvements, from that all the way down to $1 per acre; average about $8.

MISSISSIPPI.—*Noxubee:* Increasing; prairie lands worth about 60 per cent. of what they were before the war, (present value $12.50 per acre;) sandy land, being in small bodies, admitting of small settlements, and giving wood and water, is worth nearly as much as before the war; (present value, $10 per acre.)

LOUISIANA.—*Richland:* Everything is depressed in this county. Farms that would readily have brought $40 per acre in 1860, can now be purchased for $10. *Jefferson:* There is no sale for farms. I attended the forced sale of a plantation a few weeks ago; the property was worth $300,000 in 1860; it sold for $50,000. *Tensas:* Farm-lands are decreasing in productiveness; but the market-value is increasing just in proportion to amount of available labor in the parish. This increase of labor comes from the poor hills of Mississippi, and from Virginia and the Carolinas. *Concordia:* The price of land is nominal; there is very little capital to invest; a desirable plantation can be bought for $30 per acre, that being about the highest price. *Franklin:* Compared with their value in 1860, prices range at about 25 per cent.; for example, lands which commanded $10 and $20 per acre at that time, cannot now be sold.

TEXAS.—*Freestone:* Increasing constantly. From the great decrease in value caused by the recent war, they are about recovered. *Victoria:* Lands that will produce from 30 to 80 bushels of corn per acre can be bought at from 50 cents to $20 per acre, the location

determining the relative price. *Atascosa:* Farming lands that could have been bought in 1860 for $3, are now worth $5 to $10 per acre. *Titus:* The uncertainty of labor of late years has done much to decrease the value of farm-lands; but this uncertainty is now to some extent giving way, and they are again increasing, and prices now range about the same as in 1860. *Lampasas:* Average price of good arable unimproved lands, $1.50 per acre; improved tracts, $4 to $5. *Fort Bend:* Farm-lands that now command $10 per acre, in 1860 commanded $50. Many plantations which then changed hands at $40 to $60 per acre, have within the last three years changed hands at $3 to $10 per acre. A plantation purchased in 1859, at $50 per acre, was sold by the administrator of the purchaser in 1867, and bought by myself, at $4.50 per acre; its value now is about $10 per acre. *Grimes:* Prices in 1865-'66-'67-'68 went down to as low as 30 per cent. of the price in 1860, and since then have been improving; now about 75 per cent. *Williamson:* Good improved farms are selling at $8 to $15 per acre; unimproved, at $1 to $5; all depending on the amount of timber. The State is fast settling up with a better class of immigrants, and lands have advanced more in the last year than in the ten previous. *Coryell:* Good farming lands are increasing in value greatly. Good lands that could have been purchased in 1860 for 50 cents per acre, now command $15 to $20 in gold. Lands of the best quality, the river-bottoms, are worth from $5 to $12 per acre in their wild state. Good prairie lands can be purchased for $2 per acre.

ARKANSAS.—*Prairie:* Lands in farms, worth before the war $50 to $80 per acre, are scarcely now worth more than $20 to $30. Wild lands that sold in 1862 for $30 in gold are now offered for $5. *Columbia:* Many tracts have sold at less than $2 per acre within the last few years. Every man who depends upon hiring or renting wants to sell. In 1860, lands with improvements on them would sell at $5 to $7 per acre; land unimproved, at $3. Our best farms could now be bought in tracts of 400 to 1,000 acres at $2.50 to $4 per acre, on one or two years' time. Smaller tracts a little more. *Marion:* Farm-lands are increasing in value; they are worth now what they were in 1860; they had decreased largely during the war. Lands that were worth $5 per acre in 1866 are now worth $20 per acre. *Montgomery:* Farm-lands are increasing in value, owing to emigration, but not largely; say 10 to 15 per cent.

TENNESSEE.—*Campbell:* Increasing. From 15 to 25 per cent. higher. *Rhea:* Increasing. A farm was sold in 1862 for $5,000; resold in 1872 for $13,500. *Blount:* Good lands are one-third higher now than in 1860; poor lands have changed but little, except near Maryville and along the railroad. *Fentress:* At the close of the war, lands were worth nothing in money. Within the last three years vast tracts of wild lands have changed ownership at 5 to 30 cents per acre, going mainly to Pennsylvania speculators, and will not be on the market again at less than about as many dollars per acre as they cost cents. *Henry:* In 1860, $20 per acre was an average price; in 1866 and 1867 $10 per acre; now, $15. *Knox:* The best lands are increasing in productiveness and value. The third and fourth rate lands are decreasing for want of system and proper rotation of crops. Average increase of value about 30 per cent.

WEST VIRGINIA.—*Berkeley:* Limestone lands throughout the entire county are now worth $50 per acre; along the more public roads and in to market, $80. Slate lands of good quality, $30 to $35, owing to location and improvements. *Preston:* Since the close of the war till within the last year or eighteen months, lands have advanced 33⅓ per cent. in value, but are now depreciating owing to the cramped condition of the finances. *Tucker:* Land is decreasing in value. *Fayette:* Improved lands rate from $5 to $20 per acre; land in the woods, from $1 to $3.50; before the war it rated from $2 to $5. *Randolph:* Farm-lands are worth about $5 per acre more than in 1860.

OHIO.—*Tuscarawas:* Farm-lands have increased in value since 1860 materially, in consequence of the mineral deposits, such as heavy deposits of black band and other varieties of iron ore, and extensive coal deposits, which are being developed by the location of new railroads. We also have the best of clay and limestone in abundance. *Champaign:* Farm-lands are not increasing in value at present. They have already come to be rated above what they are worth for farming purposes. *Medina:* Farm-lands are decreasing in value at present, both intrinsically and actually. *Trumbull:* The value of lands is continually on the increase, and are worth on the average $15 per acre more than in 1860.

MICHIGAN.—*Kent:* The average value compared with 1860 is from 75 to 100 per cent. higher, owing in part to increased railroad facilities, and in part to the general increase of values, and in part to the better standing and appreciation of our State as a farming State.

INDIANA.—*Scott:* Farm-lands are increasing in value. The increase will average about $5 per acre since 1860. *Decatur:* Good land is worth about $8 per acre more than in 1860. *Hamilton:* Lands have been about stationary for the last ten years. Timber-lands are nearer equal with cleared. The advance since 1860 has been from $10 to $15 per acre. *Jennings:* Farms are lower here than in 1860, on account of the fact that so many railroads have been built west and have opened up so much wild cheap fertile land.

ILLINOIS.—*Cass:* Decreasing. Now down almost to the price in 1860. In 1869 and

1870 improved land ranged from $40 to $75 per acre; now, from $30 to $50. *Richland:* During the past two years farms have not advanced over 5 per cent. on the value of 1870, and this has been caused by the improvements made on them. From 1860 to 1870 the increase in price was over 100 per cent. *Hancock:* The intrinsic worth of land is not now as much by $10 per acre as in 1860, but the numerous lines of railroad built through the county since 1860 have caused it to be 50 per cent., and in many cases 100 per cent., higher than then. *Morgan:* The best farms now are held at $75 per acre, and none less than $35. *Ogle:* Present prices from $25 to $80 per acre, according to location and improvement. *De Witt:* Not so valuable as they were five years ago, but at least 33⅓ per cent. higher than in 1860. Decreasing in value at present, owing to the extremely low price of farm products of all kinds. *Clark:* Increasing, at least 50 per cent. since 1860, besides the increase in value by improvements, which is at least 50 per cent. more. *Winnebago:* Land worth $20 to $25 per acre in 1860 was worth $40 to $45 in 1870; since then it has not depreciated nor advanced, except near fast-growing cities. *Boone:* On account of improvements farms are higher than in 1860, but decidedly lower than in 1868, because of the decrease in the prices of farm products. *Lawrence:* The western fever for cheap lands and free homes is a constant drain on our population, and causes land to be sold for less than its real value. *Macoupin:* About the same price as in 1860, but they have been much higher. *Putnam:* Good farms are worth $45 to $75 per acre. *Madison:* About 40 per cent. since 1860; where more capital has been used for improvements the percentage is of course greater. It is an accumulation, not an increase. *Peoria:* Decreasing, owing to the rapid development of the States farther west, which has attracted all the emigration, even drawing on the population and capital of this State; to the fact that agriculture does not pay, and to the general depression in business. *Lee:* Decreasing. Cause: railroads running west through large tracts of cheap lands where wheat and other grain can be raised and sent here for less than we can raise it. Good farms can be bought here for $25 to $50 per acre, with good, fair improvements, that would have brought, in 1860 to 1865, $30 to $75 per acre. *Stephenson:* About on a par with 1860, but 25 per cent. less than four years ago. *McLean:* Decreased in value the last five years, but about the same now as in 1860. Are now better improved, and perhaps with the improvements would sell 10 per cent. higher.

WISCONSIN.—*Outagamie:* All farms, especially those which have not been cropped to death by cultivating wheat, have increased in value since 1860, average about 25 per cent. *Saint Croix:* Increased since 1860, on the average, 25 per cent.; timber-lands fully 100 per cent. The completion of the West Wisconsin Railroad to Hudson, on Lake Saint Croix, and the connections by railroad with Saint Paul, Minnesota, have greatly enhanced the price of farm-lands. *Fond du Lac:* Farms that sold in 1864 for $75 to $80 per acre are now down to from $55 to $60. *Dodge:* Decreasing, except wood and timber lands, which are rising; about 20 per cent. higher than in 1860, and about 20 per cent. lower than four or five years ago. *Brown:* Increasing, on account of the iron-smelting furnaces in the county, and new railroads. *Vernon:* Under the wheat-growing system farming lands are decreasing in productiveness, but still are increasing in value owing to increasing population. Lands in the old-settled parts that were worth $25 per acre in 1860 are now worth $30, and in more recently-settled parts they have doubled in value. *Green Lake:* Decreasing, though worth more than in 1860. They have been much higher since that date than they are now.

Waukesha: Improved lands range in price from $20 to $30 per acre; improved farms from $40 to $65 per acre; close to villages, $100 per acre.

MINNESOTA.—*Goodhue:* About five years ago there was a great decline in the market-value of farms; during the last three years farming lands have remained about stationary. *Watonwan:* In 1860, 95 per cent. of the land was held by the Government at $1.25 per acre. Much Government land in the county yet, and large grants of railroad land. Average market-value of farms now about $12 per acre. *Faribault:* In 1860 most of the county was Government land, which is now worth $10 to $12 per acre.

IOWA.—*Delaware:* Increasing—about double; then worth on the average about $12.50, now $25 per acre. *Appanoose:* Not increasing. In 1860 worth from $3 to $10 per acre, now from $10 to $40, according to location, improvements, &c. *Clinton:* Have increased 100 per cent. since 1860. *Boone:* Increasing quite rapidly. More than half the farms in the county have been made since 1860. The same land at that time was bought at $3 to $5 per acre; these farms are now worth $25 to $35 per acre. *Sioux:* Increasing rapidly; no farms in the county in 1860. *Cherokee:* Increasing slowly. The price of wild lands is from $3 to $7 per acre, according to distance from market and intrinsic value. In 1860 there were less than one hundred inhabitants in the county, and the average price of land was about $2 per acre. Improved farms are worth $10 to $20 per acre; in 1860 they would not have commanded more than $5 per acre. *Adair:* Market-value in 1860, $5 to $10 per acre; now, $10 to $40 per acre.

MISSOURI.—*Crawford:* Improved lands, $20 to $25 per acre; unimproved, $5 to $12, which is fully double what they were in 1860. *Logan:* In 1860 the lands in this county would probably average in value $2.50 per acre, now nearly $15; some improved lands

$40 per acre. The wild lands rarely sell for less than $10 per acre. *Decatur:* Decreasing; 25 per cent. higher than in 1860. Two or three years ago it was probably 100 per cent. higher than in 1860. *Jackson:* The average value of farms in this county is about $45 per acre. *Woodbury:* Since 1868 some three lines of railroads have been built through the county and are now in operation. The average value of farms since 1860 is doubled. *Grundy:* Decreasing. As nearly all we raise is shipped, railroad-tariffs regulate the price of land. At present corn cannot be shipped, and as our farmers have not the means to buy stock to eat it, they are burning it for fuel. I think 300,000 bushels have already been burned in this county this winter, and yet it sells for 10 cents per bushel. *Poweshiek:* Worth 400 per cent. more than in 1860, but 30 per cent. less than in 1869. *Louisa:* Farm-lands are at least $5 per acre lower than in 1860, and $10 lower than in 1866 and 1867. *Dallas:* Farms that were worth $10 to $12 per acre in 1860 are now worth $25 to $30. *Marion:* Farm-lands along the lines of railroad are now about at a stand; at a considerable distance from railroads they have decreased in the last two years. *Mississippi:* The best farms in this county, situated in most favored localities, have changed but little in value since 1860; other farms which can be reached by men of ordinary means are some 10 or 20 per cent. higher, and wild lands susceptible of cultivation are perhaps from 50 to 100 per cent. higher than in 1860. *Nodaway:* Farms have decreased in value the last year fully 20 per cent., yet are higher than in 1860. *Caldwell:* Land worth $12 per acre in 1860, is now worth $20 per acre. *Boone:* Farm-lands are 20 per cent. lower than two years ago. *Cole:* Prices have decreased materially since 1869, and are about stationary now. The price for 1873 and 1860 is about the same. *Schuyler:* The increase of the price in farm-land has been in the vicinity of railroad stations. *Pemiscot:* Farm-lands were higher in 1860 than at the present time on account of destruction of the levee that was in process of construction. The price of lands has decreased since 1867.

KANSAS.—*Marshall:* This county in 1860 was mostly Government land. Its nine hundred square miles is now worth over three millions of dollars, or from $5 to $20 per acre. *Labette:* The value of lands increasing slowly. In 1860 this county was the hunting-ground of the red man, (Osage;) there was not a white man in the county at that date. The average price of land at the present time is $13.25. *Johnson:* Farm-lands have decreased in value during the last two years, but 100 per cent. higher than in 1860. *Cherokee:* Farm-land is increasing very slowly in value. All the land in the county is held by a railroad company at from $6 to $15 per acre; the price is far above its value or what the people can afford to pay. *Woodson:* Farm-lands are increasing in value. A farm of 160 acres I purchased in 1860 for $300, I was offered $3,500 for and refused. I give this as a fair average. *Lincoln:* This portion of the State was not settled until 1867. Farming lands range from $1.25 to $20 per acre. *Franklin:* During the war there were few sales of land, and no improvements; after the war closed, for a few years, improved farms sold as high as $20 to $25 per acre; at this time the same would not bring over $15. The new lands on our southern border and west of us have drawn emigrants away from the older-settled portion of the State. *Nemaha:* Since 1860, improved farms have increased in value 300 per cent., where they are within five or six miles of the railroad. Farther back they have increased 150 per cent. *Republic:* Lands are now increasing in value because they are now about all settled; the average of farms would be about $5 per acre. In 1860 there were only about a dozen families in the county, and they staid at the risk of their scalps, and lived on buffalo-meat. *Cowley:* Lands are advancing in value; they belonged to the Indians and buffalo in 1860.

NEBRASKA.—*Pawnee:* In 1860 nearly all the land here belonged to the Government; now it is all either occupied by the settlers or owned by speculators; and is worth from $5 to $25 per acre, according to location. *Gage:* Wild prairie-land is worth from $8 to $10 per acre; improved farms, from $18 to $20. *Thayer:* Increasing in value. Average price, $10 in 1860; but few white people were in this county at that time. *Cedar:* Price of land increasing.

OREGON.—*Clackamas:* The inflation in the price of farm-lands caused by the introduction of railroads a few years ago has somewhat subsided, yet good land, well located, commands a good price. *Douglas:* The price of farm-lands is stationary at present. *Union:* Land has increased from nothing to from $2 to $10 per acre. *Linn:* Farm-lands are slowly appreciating in value. Our average farm-lands were worth in 1860 $8 per acre; at present, $20.

CALIFORNIA.—*Amador:* Slightly on the increase at present, but hardly as high as in 1860. In 1860 the placer mines were not exhausted; as the placers were worked out and abandoned, prices of farm-produce went down. The development of quartz, copper, and coal mines has caused a revival of business. *Contra Costa:* Near centers of trade and convenient to transportation, arable lands worth, in 1860, $2 to $10 per acre, cannot now be bought for less than $10 to $100. *San Diego:* In 1860 the value of lands was about 30 cents per acre; but about four years ago ranch-lands took a rise, and went up to about $4 per acre. *San Bernardino:* In 1860 I and others sold lands for

$4 and $5 per acre; a short time since I sold the same quality of land, contiguous, for $20 per acre. *Lake:* Lands are increasing in value at about 25 per cent. per annum, and have been for several years. Illustration: I bought the farm on which I now live, in 1860, for $1.25; it is now worth $4,000. *Alameda:* All farming lands have advanced from $1.25 per acre and upwards a few years ago, according to quality and location; and now many of these lands are held at prices ranging from $25 per acre to $150, and will pay interest at those figures.

COLORADO.—*Huerfano:* We have no value attached to our lands; the way is still clear for those desiring farms to take up claims. There are claims on the Huerfano, Cucharas, and Apishpa that could not be bought for $50 per acre. *Larimer:* Farm-lands are increasing rapidly in value. No comparison can be made with 1860, as at that time there were no white settlers in this county. I think it safe to say that it has doubled in last four years. *El Paso:* Farm-lands are increasing in value. Good farm property has advanced 200 to 300 per cent. in the three years past.

UTAH.—*Morgan:* The price of land has gradually increased. Meadow-land is valued at $50 per acre, tillable land at $25 per acre.

DAKOTA.—*Union:* Farm-lands are rapidly increasing in value. In 1860 there were but few settlers in this county. Farms that were taken under the pre-emption and homestead laws six or eight years ago are worth from $1,000 to $6,000.

DISCOURAGEMENTS AND THEIR REMEDIES.

The farmer is sometimes credited with a disposition to view too continuously the clouded aspects of his business. While seed-time and harvest fail not, and honest labor makes sure of some reward, the extent of that reward must vary somewhat according to the vicissitudes of the season, the skill and assiduity of the producer, the wants of the consumer, and the unhallowed combinations of greed and knavery to filch from toil a large measure of its slow accumulation. The farmer lives in isolation, but not in idleness; the non-producer of Ishmaelitish instincts, standing outside of the real necessities of legitimate exchange and transfer, with wits sharpened by hungering for the bread of others, marks the producer for his prey; and it is no disparagement to the one, in the midst of his unsuspecting and toilful pre-occupation, that he loses frequently by the consummate arts of the other. Scarcely any other result is possible when the Ishmaelite is a wealthy and far-reaching combination, perverting a beneficent vocation into a scheme of plunder.

The farmer's business is rarely if ever one of excessive profits; yet it is safe, healthful, respectable, and, with the employment of an equal measure of tact and perseverance, is surer than most others to lead to a satisfactory competence. In the present era of speculation, when agricultural colleges educate farmers' sons for the stock-market rather than stock-growing, and agricultural fairs tend more to the advantage of "the turf" than the soil, it is not strange that some discontent among farmers should arise at the slowness of their pace in the journey of accumulation. While it is perfectly safe to assert, and an easy task to prove, that the past ten years have constituted a period of average prosperity, (except as to the direct losses of the late war in the theater of its operations,) with which no similar period in our history can compare, it is true, as the annual records of prices have shown, that for several years past farm values have been receding slowly from the high point attained soon after the close of the war; and also true that wide fluctuation in price, still more discouraging in its influence, has resulted from a failure to keep the proper balance in variety of production. There is a feeling of discontent that naturally arises from a comparison with those times of high prices, apparently prosperous, though delusive, as all periods of temporary prosperity must be, as expressed by the correspondent of Crawford County, Pennsylvania: "Farmers can neither make as much money, nor so easily, as during inflation of currency."

The responses to the March circular, relative to causes of discouragement, afford no indication of permanent hardship or remediless disadvantage. Indeed, the more serious of the evils complained of may and should be overborne as a direct result of effort that never would be put forth but for the weight to which the burdens have attained and the co-operation secured by a public complaint of them. The leading difficulty in the West, and a prominent one in all sections, is the burden of railroad transportation, which eats up the bulk of the farmer's heavy products, unless he wisely insures their being eaten instead by the animals of the farm, for he has his choice, to fatten beeves or bondholders. This burden is more irritating from the fact that the shipper in many cases pays more for carrying a bushel of corn a short distance than for a longer one on the same road. In the South the great trouble is with its labor; not its relative costliness so much as its unreliability, nor its inherent insufficiency so much as its instability, while in other sections there is a general complaint of its high cost in comparison with the prices of its fruits. The other causes of discouragement complained of are numerous, and among them are low prices of most farm-products, high rates for merchandise, and increase of cost of agricultural implements; poor crops, resulting from drought, from lack of drainage, want of irrigation, and deterioration of soil; ravages of grasshoppers, the cotton-caterpillar, the Colorado beetle, the chinch-bug, the hop-louse, and many other insects; the depredations of dogs, plunder by vagrants, and the increase of Canada thistles; the cost of fences, the scarcity of fence-materials, and the attempt to cultivate too much land; extravagance, a spirit of speculation, and discontent with the business of farming; poverty, laziness, misdirected effort, and slovenly practices; want of transportation facilities, lack of a home market, and need of manufactures; a habit of buying on credit, unnecessary expenditure, and inability to hold products for higher prices; the combinations of "middlemen," including the grain-ring, the flax-ring, the implement-seller, the commission-merchant, and the huckster; the extension and re-issue of patents which have paid handsome dividends; and, among other things, venality, corruption, and unworthiness of corporation and government officials. There is also a great deal of complaint of taxation in all parts of the country, and especially in the South, where it is generally coupled with denunciations of the local government—a complaint of paralysis of agricultural energy, caused (as expressed by our correspondent at Gadsden, Florida) by "a government of irresponsible and reckless strangers, who have gained the confidence of the ignorant class to oppress the farmers of the State."

A small minority of the reports declare that no cause for discouragement exists. They are scattered through the country, more frequently in Pennsylvania, where prosperity of manufactures and mining have given great encouragement to agriculture; in New York, Michigan, Indiana, Texas, and California. In Westchester, New York, the only depression is said to arise from the fact that "those who want to sell cannot get ten times as much as their farms are worth." Columbia, New York, is another happy county, where the farmer, while getting only 18 to 25 bushels of rye per acre, is enabled to obtain $20 per ton for the straw, through the influence of manufactures; and in Livingston "the farmer is independent, his condition needing no improvement." Defiance, Ohio, defies misfortune, and "increases in wealth and population faster than ever;" and Williams claims that "prospects are fairer than ever." No discouragement stalks in Kanawha, West

Virginia, "except from grain-raising." There is no discontent in Jackson, Michigan, "as prices are good for wheat and wool, for hay and horses," which are some of the staples of that State. The people of Sibley, Minnesota, are encouraged in the belief that "there is no better county to settle in." In the cotton region there are some counties which have no complaint to present; yet some (*e. g.*, Butler, Alabama) express the belief that greater variety, instead of all cotton, would be safer and better. In Cambria, Pennsylvania, the seat of extensive iron and steel works, no cause of dissatisfaction appears, notwithstanding the prosperity of the iron manufacture; but improvements and progress are rife. Agriculture "was for many years much neglected in this county, and is yet far from what it ought to be, but has recently received a great impetus, and is making good progress; good stock has been introduced, and fertilizers sought after." The farmers of Jennings, Indiana, acknowledge having too much corn in the past two years, overtaxing their cities for shipping and reducing prices; otherwise their condition is prosperous. The people of Tooele, Utah, contentedly declare "water is plentiful and the soil fertile; we average the best crops in the United States, and receive the highest prices."

A cause of discouragement, unnecessary though practically real, which is found in all sections of the country, is thus hinted at by the correspondent for Macon, Georgia: "The universal desire to realize the largest possible present income, and willingness to sacrifice permanent improvement to that attainment." Judicious tree-planting, proved to be a remunerative investment, is one of the last to be made, because an income cannot be derived from it the first year; and there is even neglect of stock-growing, because of returns from a similar reason. Cultivation that admits of two or three crops per annum is therefore popular. Draining is neglected, because its returns come in annual installments, however large these repayments prove. All permanent improvement, in the nature of an investment, is deferred to the distant future. Impatience is the bane of American husbandry; and haste and superficiality are attendant evils, subversive of production and profit. It is to be hoped that this state of things, incident to the settlement of a new country, is temporary, induced by the prodigality of our natural resources and the paucity of personal resources, and that the future will provide a speedy remedy.

There *may be* an excuse for reckless depletion of the soil. If not, whole communities of pioneers are destitute of common sagacity and practical sense. The settler goes to the western prairies without capital, other than a fair share of brain and muscle. His bare acres cost him the fees of the land-office, and each acre may be worth to him and his heirs the annual interest of $100. Having no other resource, he takes (in repeated exhaustive crops) a slice for fencing, another for farm buildings, and still more for the clothing and education of his children. Land to him is capital, and his business a speculation, rather than farming; his farm a gold mine, to be had for the finding: shall he live in penury lest his digging shall exhaust the vein? Besides, he finds little decrease of yield in repeated croppings, and actually deems fertility inexhaustible. When prices appreciate, population increases, and the ordinary conditions prevail, he must change his course, adopt restorative cropping and improved methods, or he will have to contend with deterioration and loss. The correspondent for Cherokee, Kansas, puts the matter in this light: "Rich prairie is a national bank, whence men borrow the funds for the support of themselves and fami-

lies, and the education of their children; and a man is very foolish to leave his children ignorant and his wife without comforts, and spend his profits in trying to better a quarter-section of land which, with good cultivation, will make him rich, as surely as anything he can do."

Many peculiar causes of discouragement are mentioned. Among others the cost of fences and the losses by unrestrained cattle are of frequent mention in nearly all parts of the country; but the evil is most severely felt in Texas and California. The following are sample extracts:

Franklin, Mo.—Another want sadly felt among thinking farmers is a good, efficient stock-law enforced. The scrubs would be got rid of, good stock only would be kept, and a good price could be got for it in market. As an example, I will add that two weeks ago I saw sold at a Saint Louis stock-yard two milch-cows at $7.50 each, that ought to have brought the farmer $30 each.

Refugio, Tex.—The great incubus that has for years been a moral and pecuniary pestilence to the State of Texas is the system of turning stock loose to roam at will; but we are not without hope that our present legislature, now in session, will relieve us of this evil. Then, with improved implements for which our country is so well adapted, we will show a satisfactory record. Take away the necessity of a fence to make a crop and we will furnish you meat of the finest quality, instead of the millions of hides from famished animals.

Another evil operating against the stock interest is bitterly complained of in all parts of the South.

Wilcox, Ala.—I believe there is more money's worth burned in the fall and spring in my vicinity in the shape of dry grass and fences than there is of cotton sold, and that is all we do sell. But if sheep, hogs, and cattle are raised, the loss from stealing is so great as to discourage and disgust. One of my neighbors turned out last spring into a swamp pasture about sixty shoats. There has been no disease among his hogs, and he will have to buy meat to supply a family of five persons.

The farmers in some portions of California suffer from another form of injustice:

Tuolumne, Cal.—Lands segregated as agricultural by the United States surveyor, where there is no profitable placer-mining, where there is scarcely a mine that pays half daily wages, where the mines have been exhausted and the land filled up and reclaimed at great expense by the farmers, have been withdrawn as agricultural and declared mineral. The burden of proving their non-mineral character being thrown upon the farmers, and the cost of obtaining titles doubled, worthless miners are enabled, by filing mineral affidavits, to blackmail them or force them to expensive trials. A common man cannot obtain a title without employing a lawyer, and his fees, the fees in the land-office; publications, citations, travel of himself and two or more witnesses from forty to one hundred miles to the land-office, will amount to as much, and often a great deal more than the amount paid the Government for the land. Where there is a contest, in nine cases out of ten the farmer had better abandon his land than go to the expense of a trial. The county officers, elected by the miners, have seldom a permanent interest in the county; have been paid enormous salaries; have squandered money, and every mining county is hopelessly in debt. The rate of taxation in this county has been for years nearly 5 per cent. This year it has been somewhat reduced. As the miners, with but few exceptions, pay no taxes, the burden of taxation falls upon the farmers. The internal-revenue taxes have also been very heavy upon the wine-growers. The remedy is for the Government to recognize the fact that placer-mining is exhausted; that it is now a curse instead of a benefit; that it does not enrich, but impoverishes the miner, and is desolating and destroying the counties where it is carried on.

Complaint is made that the tendency is strong among farmers to divert a part of their time and means to other business, sometimes to invest the profits of the farm in railroads that pay no dividends to original stockholders, when the farm is suffering for drainage investment that would pay 20 per cent. Some are making investments in building up towns and villages, and neglecting the improvement of the farms which gave them their surplus. An urgent protest against this tendency comes from Baltimore County, Maryland.

The want of attention to forestry in the prairie region is lamented by several correspondents.

Brown, Minn.—Another drawback against a rapid development of our county is the scarcity of timber. Thinking men are of the opinion that Congress should pass a law that no homesteader should get a patent of his land before he has given satisfactory evidence that he has planted five or ten acres in timber.

LABOR DIFFICULTIES.

Six years ago an investigation of the rate of wages of farm-laborers was made by the statistician of this Department, and three years later another, which showed a slight decline by no means comparing with the decrease of prices of farm products. It was shown in December, 1866, that the average value of farm labor, white and black, skilled and unskilled, was about $26 per month, without board; when board was furnished in addition, $15.50, leaving $10.50 as the average for board.

The average wages per annum for white laborers, including all grades of service, was at the same time $336, while the estimate average for English farm-laborers was $182, including the value of all extras and allowances. Thirty-three years ago the pay of farm-laborers was estimated by Mr. H. C. Carey at $9 per month for board.

In December, 1869, the average rate of wages for all farm-laborers, as estimated by the returns, was $25.13; with board, $15.88. The allowance for board was less than in the former investigation, being $9.25 instead of $10.50. Prices had declined, and wages without board were a little lower, while the rate with board was actually higher. The following is a comparison of averages of the different sections at the two periods:

	December, 1866.	December, 1869.
Eastern States	$33 30	$32 03
Middle States	30 07	29 15
Western States	28 91	27 01
Southern States	16 00	16 81
California	45 71	46 38

In a review of this subject in the report of January, 1870, it was said:

In many branches of farm-cultivation the cost of labor seems disproportionate to the cash value of its product, and the remuneration of the employed better than that of the employer.

At the present time labor continues high. It is high because scarce, from withdrawal to fill the requirements of manufacturing and mining industry, the demands of traffic and speculation. Because thus drained of skill and energy, its standard of efficiency is lowered. The responses to the March circular are full of labor complaints from all sections.

Scarcity is general, though perhaps more frequently and strongly urged in the Eastern and Middle States. In the South scarcity comes not alone from paucity of numbers in proportion to work to be done, but from indisposition to do it. There is a strong feeling among farmers against legislation limiting the hours of a day's labor as impracticable and injurious to employer and employed. In the more populous States a native farm-laborer is a rarity. As in Washington, New York, "there is scarcely a native or skilled laborer to be had; all looking

higher." Enterprising young men who propose to engage in farming, generally go West to "grow up with the country."

The few laborers attainable are mostly foreigners, and many farmers limit their operations to avoid the necessity of their employment, preferring to live quietly, and scarcely daring to assume the expense of hired labor. Our correspondent for Chemung, New York, suggests, as a remedial measure, the giving of "help" an interest in the crops in addition to wages. There are many who meet the difficulty quite philosophically. The Jefferson, New York, correspondent says, "Let us rather pay high wages than high taxes for the support of the poor. There are so many labor-saving machines now in the reach of the farmer that if he and those of his family who are able to work take hold in an earnest and judicious way, he may get along with much less hired help than he could in the good old time when all the work had to be done by hand."

It is by no means a misfortune to the country that wages are high in proportion to the cost of the necessaries of life. The fact that every farm-laborer may have a spot of land to call his own is the crowning glory of our country, and his disposition to claim the boon is the highest evidence of his intelligence and patriotism. The following extracts are in point:

Monroe, N. Y.—Any man of energy and capability can and will get a piece of land of his own, and, by raising vegetables and other crops that require but little land and much labor, can do as well or better than the average farmer, and be more independent, profitably combining the labor of his family with his own. This is an excellent thing for our country, but inconvenient for the farmers who have to employ hired labor.

Darlington, S. C.—The labor question does not affect small farmers whose families do the principal work. This class is making more money and succeeding better than any other, and better than they ever did before.

The following extracts, from many of similar tenor that might be made, illustrate further the difficulty in obtaining desired supplies of labor and the resulting cost when obtained:

Delaware, Pa.—A few are securing Swedish laborers through an association in Wilmington, Delaware. By paying a sum of money in advance, say $50 or $60, they are furnished by the association with a newly arrived Swede, whose pay is to be $10 to $12 per month, for one year. About 75 per cent. of the sum is paid in advance, to be deducted from his or her wages; women's wages, of course, being less than men's.

Gloucester, Va.—Farmers have too much land; pay taxes on dead capital, and cannot procure steady, reliable labor. Our best and ablest laborers are employed in oystering, wood-chopping, and lumbering.

Nansemond, Va.—The remedy naturally suggesting itself is to increase the products from every acre, so as to render it profitable and possible for the farmer to pay higher wages. To divide the land into smaller farms, adopt the English system of long leases, establish manufactures of all kinds for home products and all implements used on the farm. Thus will come home markets and population. At present, at least one-third of the gross proceeds of all the farmer sends to a distant market is lost to him from expense of packing, freights, and commissions.

Botetourt, Va.—Farmers have too much land. We have thousands of broad acres of as fine land as there is in the world, uncultivated for the want of proper energy and sufficient labor. Of course we shall complain of hard times until such land is sold or properly cultivated. Another cause I must mention—*our own people have not learned how to work.*

Rappahannock, Va.—The close of the war left the farmer with his land in bad condition, no stock on it of value, no money, and perhaps in debt. Labor since has been inadequate, and almost worthless, and getting worse every year. The best laborers go to Washington City. Taxes are necessarily high. All of which operate as causes of discouragement, combined with the scanty products of soil from poor cultivation, rendered so from scarcity of labor.

Nelson, Va.—The most industrious and reliable among the freedmen seek employment on our railroads and other public works, where they can get better wages than farmers can afford to pay. This leaves the indolent, improvident, and thievish, with the women and children, among us to get their living by pilfering or otherwise, as best

they may. This disorganized condition of our labor I regard as more discouraging than any other. At the same time there is no disguising the fact that our white labor is far from being what it ought to be. A very large number of this class of persons formerly owned slaves themselves, or are the sons of former slave-owners, and do not take to work with an *appetite* for it. When they get to work they watch the slowly wheeling sun, and, with a yawn, often wish that "night or nigger would come."

Matthews, Va.—Chief causes of discouragement are impoverished condition of lands, want of capital to resuscitate, and uncertainty of labor. The remedy that would naturally suggest itself would be to sell off a part and improve the remainder; but purchasers are scarce. Oyster-planting absorbs all the floating capital and labor, and will keep the lands poor as long as it will afford the means of living to the laboring classes.

Pitt, N. C.—The first great cause of discouragement to farmers here is the annual exodus of the able-bodied freedmen to the States south, to engage in turpentine-making. Many of these never return, finding homes there or on going further south. They are enticed by the high prices, $20 to $25 per month, a sum much greater than cotton-producers can afford to pay. Large numbers have left us this year for that business. There is a great complaint of scarcity of labor, and we have the old story of freedmen being bad laborers. While this is in some measure true, and many farmers say they get worse every year, we are getting used to it, so that good labor would astonish us. This labor being our only dependence, and the supply so far short of the demand, there is not one-tenth the labor in this county that is required.

Cumberland, N. C.—Four-fifths of our land is covered with native pines. The turpentine business absorbs all the first and nearly all the second rate hands, leaving only third-rates for the farmers, for which he is compelled to pay the most exorbitant wages. Able-bodied men get from $18 to $26 per month and board, to work turpentine; the farmer cannot afford to pay more than $12 per month. He can only get women and boys, and pays for them $8 to $12 and board per month. Even with these he might get along if there was any law to make them abide by their contracts; but there is none.

Hardin, Tenn.—I can suggest no remedy for unreliable farm labor, except that the land-owners sell out their large farms, in small quantities, to men who will cultivate them by their own labor.

Coshocton, Ohio.—The greatest cause of discouragement existing among farmers is scarcity of laborers, both male and female. We have imported several families from England and Ireland by advancing payment of their passage. A large majority of these labored faithfully and fulfilled their contracts, but some, after their safe arrival here, left us for parts unknown.

Medina, Ohio.—Scarcity and high price of labor are discouraging to farmers, and for that they are greatly to blame themselves. Take this township (Hinckley) as an example: In 1850 we numbered 1,416; in 1860, 1,227; in 1870, 972 inhabitants. Cows and sheep have displaced men. Farm has been added to farm, till the owner can hardly manage them. In summer competition is great to procure men to cut hay and grain. In winter there is little to do; one man can throw fodder to a great many cattle and sheep; hence our young men go off and find employment on railroads or in the cities, and once off, seldom return to live at home again. What is true of Hinckley is true of the county. The remedy is for farmers to be content with smaller farms, and try to make them rich and productive.

Clinton, Mich.—I paid last fall one-fourth the value of my corn in cash for husking, and did not get it finished at that.

There is much competition for foreign immigration. The tide has hitherto gone westward, seeking free homesteads. As eligible western lands become scarcer, the tendency to look southward is becoming stronger, and a heavy immigration promises ere long to set in that direction. It is greatly desired by intelligent men in all of the Southern States. There is an impression, on the part of many land-holders of that region, that something like the European tenant-system will ultimately prevail, by which they may retain their extensive estates and become enriched by the labor of others, an idea that has already been a bar to immigration. The foreign laborer of any value is prompt to seek land of his own, and will not be long content to labor for wages or even a share of the crop. A correspondent in Florida (Columbia) complains that immigrants claim a homestead and reside upon it, and "are consequently of little benefit to the farmers." A more practical idea comes from Hale, Alabama. "We need immigration, white men of sufficient

means to buy small farms and stock them without incurring debt." It is proposed in Stafford, Virginia, to induce immigration "by giving homesteads to immigrants, and selling in small portions on long time." In Charlotte, Virginia, "farmers from Europe are wanted to work on shares of crop for a series of years until they are able to buy small farms." The following extracts relate to inducements held out to settlers, either from other parts of the country or from Europe, by several of the Southern States:

Warren, N. C.—The principal cause of discouragement with our farmers immediately after the war was the disorganization of our labor system and want of capital. These causes are gradually disappearing, and we are more hopeful of the future. We have a healthy climate, pure water, and a good soil. Our population is refined, educated, and intelligent. What we need are capital and immigration. We want men with money, character, and energy, to buy up our surplus lands and go to work with us, and we have no doubt of a prosperous future. Our county was wealthy before the war, owning a large number of slaves; consequently we have plenty of labor. Laborers are beginning to work better and take less interest in politics than heretofore, and we think will continue to improve. A northern man can come here and buy 100 acres of land for $1,000; produce everything he needs for home consumption, and make profitable market crops, have mild winters, with very little time that he cannot do out-door work, enjoy good health, go to church on Sunday, and send his children to school during the week.

Kauffman, Texas.—Farmers here, by proper management, can succeed better than in almost any other portion of the United States, for this reason, that it takes less capital to manage a farm. Land can always be bought at fair rates, on terms suitable to a man's means. There is a disposition shown to help every new-comer along, and aid him with farming utensils.

Williamson, Texas.—The State is fast settling up with a better class of immigrants, and lands have advanced more in the last year than for the ten previous ones.

Fayette, Tenn.—The want is good reliable labor. The Department of Agriculture and National Government ought to aid us materially by authoritatively stating to the public that personal rights are as safe here as elsewhere.

Prince William, Va.—Old farms here are too large; should be cut up into small farms. We have room for one thousand additional farmers in this small county. So say to all, come to our genial climate, where you can make pleasant homes for yourselves and families; where most every necessary of life can be produced by skillful hands. This will help us the most.

King and Queen, Va.—The aid of capitalists and immigration of industrious laborers would aid very materially to develop our resources. We have a genial clime, and are accessible to the Richmond, Norfolk, Baltimore, Philadelphia, and New York markets in from six to twenty-four hours.

Marlborough, S. C.—This is certainly a much better country for those who wish to leave their old homes than any portion of the Northwest. Capital invested in planting pays as well with us as it could in any regular business. We need skilled mechanics and industrious laborers everywhere. We purchase largely of improved implements, particularly plows, all of which come from the North or West. We have every facility for manufacturing these articles, except skilled labor and the disposition to go into manufacturing. One county is improving, and our white people are all at work, most of them successfully.

Conecuh, Ala.—Form a club, each member to pay so much for printing; send circulars descriptive of soil, climate, products, fruits, &c., over the West and Europe, and let every farmer who has over one hundred acres of land give every alternate forty acres of land to every actual settler. We have thousands of acres of land in this county that could be given away, and the people, or rather the present owners, would be better off by doing so, and as Com. Maury has said that every actual settler is worth one thousand dollars to State and county, we would soon be able to pay taxes, cultivate all the waste lands, produce three times more than we could consume, pay debts, and save money.

Cherokee, Texas.—Our farmers have no cause of discouragement; on the contrary, they have much to be thankful for. A healthy country, rich land, good society, schools and churches in nearly every settlement. Many buy farms and make from 50 to 25 per cent. of the first cost a year, from the crops grown thereon, besides supporting their families. I have known farmers to buy farms for $800, and make a thousand dollars' worth of cotton the first year, beside plenty of corn, potatoes, melons, and garden vegetables. As a general rule the farmers of Texas are very liberal to emigrants; will sell lands on one, two, or three years' time, and furnish stock, tools, and provisions for the first year on credit.

Perry, Tenn.—Our farmers, as also other classes, are contented and happy, and, the

amount of capital, &c., being equal, make as much money as the same number of farmers, perhaps, of any county of the Union. Yet four-fifths of our lands are yet covered by primeval forests, and is exceedingly low-priced, while improved, *i. e.*, cleared and fenced, lands are very high, which disproportion in price is caused by the want of labor, and a disposition on the part of politicians to represent us as averse to immigration, and our society unprotected by laws.

Hopkins, Kentucky.—The great want with us is steady, reliable labor. One thousand sturdy German farmers would probably do this county more good than millions of money. We have all the elements of immense wealth, in the shape of coal of the best quality, and first-rate timber in great abundance.

LABOR AT THE SOUTH.

The labor problem at the South has long been a difficult one. It was foreseen that neither employers nor employés could adjust themselves gracefully to an instant change from involuntary servitude to free labor. In the constitution of human nature, with its habitudes and prejudices, it could not be otherwise. Our correspondence is full of references to the relations of labor, of the most direct and positive character, and a proper understanding of the status of labor there requires large license in the extracts, which are given as the views of individual reporters.

The instability of negro labor appears to be the prevalent complaint. Cotton is a most exacting crop, which requires at least ten months for growth and harvesting, while the other two are needed for preparation; and the negro is charged with breaking his contract in the midst of the season, for higher wages, for a period of leisure, or from the merest caprice that seizes him—in some instances making engagements with several persons and disappointing all. The following extracts bear upon the point:

Southampton, Va.—The negro in a state of freedom has little or no care for the future, and is satisfied with a bare supply for his daily wants. The foreigner will not come here to work with the negro, and hence a large proportion of our arable land must remain untilled. The negro is gradually gravitating to a warmer clime, (the work of time,) and in this state of transition the question is, "What will the landholder do?"—he can neither cultivate nor sell his land. This question is now puzzling the wisest heads, and our condition is becoming one of suffering rather than of enjoyment and profit.

Campbell, Va.—The most discouraging thing to the farmers in this county is the bad system of labor. The negroes are anxious to work by the day, but as soon as they get a little money they stop work until that is spent. If the farmers would co-operate in not employing them except by the month or year the system could be greatly improved.

Floyd, Ga.—The shiftless and uncertain negro has to be employed, but he is a great vexation. It seems impossible to arouse or excite him to a constant diligence or to adapt him to a modern system of farming. He is careless and inconsiderate, and has no ambition but for temporary ease and comfort, and will never become an educated laborer. If he has any talent or ambition he quits the farm and goes to town. It is only the indolent and indifferent that stay on the plantations.

Stewart, Ga.—A laborer on a farm now works no more, upon an average, than six or seven hours each day, and the wages paid are too much. Most of our farmers ruin their farms by renting lands to freedmen, and furnish them with stock and supplies of all kinds. The stock is generally badly treated, and the crop badly worked.

Bolivar, Miss.—Laborers seem to be the great cause of discouragement among our farmers. They are very unreliable; will only work for a portion of the crop, and seem to become indifferent before half the cultivating season is over, and generally neglect their crops and make nothing for themselves or the land-owner. It is impossible to convince one of them of any advantage in improved implements.

Franklin, Ga.—But few laborers have either property or credit, hence the employer has everything to furnish, anticipating payment from the proceeds of the growing crop. Most laborers are disposed to be both idle and wasteful; they soon become indebted to their employers, their demands for advances are extravagant, labor is scarce, and the employers are compelled to comply with their demands or lose their labor and the amount already advanced; hence, at the end of the year, employers are frequently losers.

Richland, La.—Most planters give their laborers a certain proportion—usualy one-half—of all that is raised on their lands, the planter finding the farming implements, mules, and feed for the same. This plan is now believed to be detrimental to the interests of the planter. Some few rent or lease the land at $4 to $6 per acre, and think they do better. Fewer still pay their laborers a certain stipulated amount of money per month. Very few hands in this county are willing to work under this arrangement.

Little River, Ark.—To make a synopsis of the laborer's mal-conditions: He has to buy his meat at 25 to 30 cents per pound; his bread for $1.50 per bushel; his drink (not water) for $1.50 per bottle; and his clothing from 100 to 200 per cent. on cost, besides interest and other emoluments to the merchant or employer for having to wait from January 1 to the time when his cotton can be gotten to market. The result is, that, at the end of the year, he has nothing, though with intelligence and care he and his family might have cleared about a thousand dollars above the cost of his absolute necessities.

Hamilton, Tenn.—The farmer makes his contract with his farm-hands, the freedmen, for the year, and agrees to pay them so much for the year in monthly payments. He "pitches" his crop—so much corn, oats, wheat, grass, &c.—for the force he has employed; they all start off in a good humor, and everything moves pleasantly until the winter months have passed, and the "spring-time has come," and the time and labor of the farm-hand is constantly required. The farmer is using every exertion to have his grain crop ready, so that he can go to his clover and grass meadows, his oats and wheat harvest, and "make hay while the sun shines," when he finds that, from some cause or other, and generally the most trivial, the freedmen have become dissatisfied, demand their time and wages, and leave the farmer to save his crops as best he can, which is difficult to do, as the demand for labor at this time is great; and if he gets other laborers it is at greatly increased wages. Sometimes the demand for wages is greater than the value of the crops to be saved.

There is another difficulty, less dwelt upon, but almost equally injurious: the inefficiency of white labor, and an indisposition on the part of many whites destitute of income to do any regular work. The following extracts illustrate this difficulty:

Johnson, Ga.—Want of energy is the principal cause of discouragement. The young whites, who were not brought up to labor on the farm, find it hard to commence that occupation, and too many of them seek the professions, and other occupations, rather than work on the farm. The colored population believed that freedom and idleness are synonymous terms. Hence, when they became free they thought they had nothing to do but lie abed until the Government furnished them with forty acres and a mule.

Coahoma, Miss.—This is our remedy: we want white labor, improved labor, so as to set an example to the colored people of superior industry and energy; laborers who can use improved agricultural implements, and know how to take care of them; who have a sense of carefulness, honesty, and attention to business—the common requirements of farm labor. Every planter should have them on his place, and should be prepared to accommodate them.

Jasper, Miss.—The white people do not want to work, and they say the negroes will not work; hence the many complaints. The only remedy that fairly presents itself, or any suggestion that I can make, is for both white and colored to take up some business or industry, and follow it instead of finding fault.

Many correspondents ask for a law compelling fulfillment of contracts, and defining the duties, rights, and privileges of landlord and tenant. There certainly should be legislation securing equal justice to employer and laborer, if it is not already upon the statute-books of States. It is evident, however, that there are unprincipled employers who stimulate and turn to their own advantage this disposition to disregard contracts.

Tensas, La.—With land cheap and cotton bringing a good price, the man who can command the most labor, either by hoodwinking, humbugging, or persuasion, makes the most money. At the beginning of each year most of the labor is unengaged, and the contest for hands is very exciting. A month or two is generally lost in this way, and hard feeling very often engendered between neighbors.

Nicholas, Ky.—I would suggest that farmers enter into an agreement not to hire or give employment to hands who had, without good cause, left the employment of another, without first consulting both parties and learning the cause of separation.

There are employers in every State in which colored labor is predominant who have the wisdom and tact to adapt themselves to the changed conditions of labor, who supervise or direct personally the operations of the plantation; and they succeed admirably, while the majority of their neighbors fail to secure efficient service and its highest profit—in instances like the following:

Pasquotank, N. C.—No cause of complaint exists among our people. On the contrary, our future looks bright. The best understanding exists between land-owners, laborers, and tenants. The laws are seldom violated. We have but little use for jails or poor-houses; and peace, order, and quiet prevail.

Madison, Ga.—Where farmers are practical men, giving their farms personal attention, no cause exists for complaint.

Hall, Ga.—There are no causes of discouragement among our farmers. They are fast learning to adapt themselves to free labor, and labor in turn has learned its place, and both capital and labor are each assuming its proper place. Few southern men knew how to manage free labor; neither did the slave know what freedom was. Many thought that freedom was rest, but they now begin to feel its burdens, and to realize the necessities of a family and the requirements of government. The country is generally rising. Most of farmers are out of debt, some are laying up money, and a general improvement is going on, with a great desire for information in agriculture. The negroes are acting tolerably well, though none of them seem inclined to lay up anything for the future.

Franklin, Ga.—Most of the lands are farmed by freedmen, who do very well if the landlord will stay with them to direct the work; where that is not done it is in most cases a failure. All that is wanted is to be with the hands, and good crops are pretty sure.

Various remedial suggestions are thrown out by correspondents, and, that each class of views may be presented, the following extracts are given:

Lexington, S. C.—The plan of employing good hands on shares of the crop is gaining favor, and must prove to be advantageous to both employer and employé, as the latter is sure to be more diligent and do better work when he has a direct interest in the crop. A want of capital, as well as enlightened self-interest on the part of our farmers, to furnish the farms with the most approved implements of culture, and especially good, heavy plows, and teams to draw them, by which our soil may be turned up ten inches, and security against drought, our *greatest* and *surest* destroyer, is what we most need. With this accomplished, the hills and plains of Carolina will teem with stores of her own hidden wealth.

Marengo, Ala.—To prevent the downward course of the planting interest, I would suggest that the planters should make themselves, in a measure, independent of labor by adopting a system of farming that would require but few laborers. These lands are well adapted to growing clover, Bermuda grass, and various native grasses of value, and stock-raising could be profitably carried on. If our planters will live on their plantations, vary their products, rely more on their own energy and brains than on the reluctant muscle of the freedmen, husband their manurial resources, and make, as far as possible, all they need at home, this section will soon become one of the most fruitful and desirable in the United States, and the lands will regain their former value.

York, Va.—A large surplus of negro population, which consumes more than it produces. If three-fourths of this population could be got rid of, the York peninsula would be a good region for sheep.

Terre Bonne, La.—I am thoroughly satisfied that the only hope for us is the adoption of the tenant system, with white men for tenants. The tenant furnishes his own team, or buys it from the planter on time, furnishes his own supplies and implements, and gets one half of the crops. The arrangement lasts for a term of five years. He has a certain tract of land marked out, which he cultivates as if it were a separate farm, but subject to the control of the planter in the methods of culture. During the sugar-rolling season, all combine in taking off the crops. This division of the business leaves the time and capital of the planter free to be devoted to the improvement of the sugar-house, and the processes of manufacture, while it secures a permanent supply of labor, and a labor paid in proportion to the crop.

Clarke, Ky.—To speak plainly, there will be no reliable labor from the colored people of Kentucky while the pro-slavery democracy are in the ascendant in the State. Now a little on the other side: The number of freedmen is by no means small who seem to think that *freedom* consists in exemption from labor; and the sole delight in their newly acquired liberty is to be idle. Not every colored man is lazy, yet it is undeniably true that, taken as a class, they are not steady workers. There is a very great disposition among them to refuse to enter into contracts to labor for periods of

much length, say by the year; they prefer "job-work." There is a great inclination to work only at certain times of the year, during harvest, hemp-breaking, and corn-cutting. At these times they will demand the most exorbitant prices, in order to spend a large portion of the year in idleness.

Princess Anne, Va.—The great and only remedy for all of our "ills" is immigration. Our large tracts must be divided up into small farms, and these farms cultivated by the owners. The farmers in Princess Anne and Norfolk Counties are growing poorer every year.

Loudoun, Va.—Farmers should adopt some modification of what is known in Europe as the "allotment" system of labor: provide our colored laborers with homes on the farms, and, through their known strong local attachments, fix them to the freeholds. Educate them, increasing their wants and raising them in the scale of being.

Charlotte, Va.—Time alone can settle the labor question. Nor are we prepared to say that the labor of the free blacks will eventually be that to be relied upon or that which will cultivate the lands of Virginia. The indications at present are that it will be set aside, and that white labor and that of the owners of the soil will eventually be the only reliable sort.

These evils can be modified, if not effectually remedied. In the first place, the tenant share system—the partnership in which the responsibility is all on one side; a business in which one party furnishes all the money and vacates all control in its use, and the other supplies the muscle for the work without brains to direct it—is a confessed failure, verifying the predictions made in the monthly report of January, 1870:

1. It is not a voluntary association from similarity of aims and interests, but an unwilling concession to the freedman's desire to become a proprietor, or an inability to make prompt payments of wages in cash.
2. It is a complicated copartnership, opening the door to fraud on one side and unfaithfulness and desertion on the other.
3. It is not equitable between the freedmen, as it renders impossible a proper discrimination between the industrious and the idle, the dexterous and the incapable.
4. It leaves uncontrolled and almost undirected those who have never been subject to self-management or self-restraint.
5. It almost invariably inspires exaggerated expectations, leads to improvident drafts upon an uncertain future income, and ends in disappointment and discouragement.
6. It debars the proprietor from exercising a control over the plantation and its operations essential to present success, and the permanent improvement of the estate.

As was said then, "the best labor contract is the simplest: stipulated wages for faithful service, which shall be paid promptly, as agreed, in cash, with an equitable portion reserved to the end of the year, both to secure the planter against having his cotton unpicked and to give the freedman a surplus for accumulation or the supply of other than daily wants." If he refuses to work in this way—and the change might be difficult—he should be patiently taught to submit his labor to the direction of higher intelligence. Opposed to the wages plan is his natural desire for independence, which is illustrated by a statement of our Winston (Mississippi) correspondent, that "freedmen are buying up homes of their own, and cannot now be hired to any extent by the white population." If he will not hire for wages, it has been shown that the best form of co-operation is that which enables the employer to control his property, not allowing his provisions to be eaten up in junketing and his forage by horses and mules that do not plow; one in which he directs personally or by a competent manager the operations of the plantation, and advances only the requisite amount of provisions in lieu of board. An equitable share system, in which labor should be wisely directed by friendly co-operation, would avoid the evils of the irresponsible tenant-share system. The principal objection to it—and one which begs the whole question—is that the two parties cannot co-operate, even to this extent. If such is the case, and the incompatibility cannot be overcome, and if then the wages system cannot be accepted, let each go to work on his own account and solve the labor question according to individual preferences and capabilities.

POOR FARMING AND BAD MANAGEMENT.

Among a class so large as that which constitutes the farming interest of this country, including contributions from almost every foreign nationality, there must be much of poverty, ignorance, prejudice, and want of industry and skill; and our returns are necessarily replete with reports of this character. These evils constitute an obstacle in the way of true growth and progressive development as an agricultural nation which are not sufficiently realized. Their existence cannot be concealed, and it is proper that a glimpse of them should be obtained through the following extracts:

Crawford, Ohio.—Farmers here need not be discouraged; everything grown can be sold for cash, at good prices; but many farms are becoming worn out, because so many farmers are so slow in learning that they cannot take good crops from the soil continuously without offering a return. Again, they cannot apparently be taught the value of draining, consequently much land is almost marsh, or too wet, which might be reclaimed by a little underdraining. Systematic rotation of crops they seem to know little of.

Kalamazoo, Mich.—Want of skill and intelligence as to the best method of farming is an evil among a large class of farmers. There is a strange prejudice against any of the suggestions of science or of *book farming*. The "stone-in-the-bag-to-mill" idea of the fathers is adhered to with great obstinacy from generation to generation. Too much land to carry on, and too little help and means to improve it properly, is another sore evil. Many a poor honest farmer is harassed and driven from year's end to year's end, and after toiling through summer's heat and winter's cold, with a burden of cares and anxieties almost insupportable, finds himself at last just able to keep the wolf from the door. The desire of farmers, each to own all the adjoining land to their farms, already too large, and the acquisition of the same as fast as money can be obtained to purchase, has been, in my judgment, one of the many hindrances to thoroughness and success. There are also the evils of the poorer class of farmers being obliged to sell their produce as soon as it is harvested, whether the market is favorable or not, of combinations of "operators" and "middle-men;" the monstrous monopolies of transportation mediums; the ravages of insects; the distemper that wasteth at noonday; the influences of climate; these and many others are mainly exterior, and can be overcome by careful, intelligent co-operation and patient investigation.

Stark, Ind.—Whatever discouragement exists among farmers arises from their own neglect and ignorance. The remedies I would suggest are a thorough agricultural education of boys designed for farmers and a thorough organization of the farmers themselves for discussion of the different methods of culture and co-operation to secure better prices.

Breckenridge, Ky.—It is evident to any thinking man that the causes of discouragement are the old-fogy notions of the first settlers from Virginia, which have been handed down from father and son until it has become the law of the land that any departure from them is a heresy not to be tolerated.

Randolph, W. Va.—Remoteness from market and want of cheap modes of transportation, combined with lack of industry, energy, and enterprise, are the causes of discouragement.

Howard, Md.—Our troubles arise from poor land, poor prices, terribly protracted droughts in successive years, poor roads, poor people, rich politicians, no enterprise, stagnation. We made some splendid beginnings of several agricultural associations, but at the last meeting, held in the rear part of a store, the president sat on a fish-barrel and received motions from the only two members present, one of whom was the writer, and he left. The remedy is in the farmer's hands, but he does not see it, and the consequent burden is grinding him to powder, standing as he does between the upper millstone of anti-combination and the nether one of apathetic ignorance.

Waukesha, Wis.—In relation to discouragements, I think none can be said to exist in Waukesha County, except such as result from stupid, ignorant, or shiftless farming. From 1840 to 1850, prices of farm products were low, markets quickly glutted, and as a rule the work of the farm done by hand. The farmer's life was then one of toil. From 1850 to 1860, some farm-machinery began to appear, and railroads for travel and transportation; but prices ruled low; wheat rusted, and frosts nipped the corn. From 1860 to 1873, seasons with us favorable; no rust; no untimely frosts of consequence; prices good, and sometimes high; market demands quickly take all products from the farm; farm-machinery does the heaviest of farm work, with more perfection than ever before; railroad facilities for marketing farm products everywhere extended. Complaints that labor is scarce and high are heard on every hand, but improved farm-machinery more than compensates that. Formerly, a strong man could possibly mow two

acres from sun to sun; now, a weak man, or an active boy, or even a young lady, with a team, can mow in less time, and do it better, ten to twelve acres; and grain is cut with about the same relative difference in labor. A mixed husbandry is the sure precurser of success with industrious, studious farmers. As an evidence of encouragement, far exceeding all the discouragements which the most complaining can see, we note the fact that now farmers have carriages, carpets, music, many of them fine houses, out of debt, and money for all needed wants.

Reynolds, Mo.—Ready sale can be found, at good prices, for all farm products, but the fact is that not one-twentieth of the farmers more than half cultivate their lands. There is no such a thing in this county as a sub-soil plow. I have told a great many of the value of sub-soiling, but they seem to think that it would ruin their lands.

Nemaha, Kans.—Many of our agricultural societies and their fairs are looked upon as a nuisance by our farmers, such as will offer $20 or more to the fastest horse, and $10 or more to a scrub-race, and $1 or $2 for the best wheat, &c., and yet we all believe that farmers' clubs, fairs, and societies are very beneficial when well conducted.

Dodge, Neb.—Poverty, a want of enterprise, a spirit of speculation, a desire to get rich on the rise of property, instead of by patient industry and economy, facilities for transportation, and the high tariffs of railways are some of our discouragements.

Oldham, Ky.—I would advise our farmers to pull off their coats and go to work; talk less of horses; quit complaining of the Government; dissipate all ideas of what has passed in the last twelve years; stop preparing for the professions every boy of talent; teach children to be both scientific and practical; elect only the best men to all offices; never go in debt for mere show; pay as they go.

Symth, Va.—Our farmers should be taught to plow under more clover, use more gypsum, build barns and stables, to enable them to save the manure; to establish schools to educate the laboring classes; a combination of some kind to lower freights and destroy railroad monopolies; by some sort of legislation to make it for the interest of the large land-owners to sell what they cannot use to advantage themselves.

Burke, N. C.—Want of knowledge in agriculture; the advantage of draining, subsoiling, and manuring is what we need to make this part of North Carolina among the most desirable portions of North America. All fruits and vegetables raised this side of the tropics are grown in abundance; our land is good and cheap, and capable of being raised to the highest state of fertility. Our climate is mild and healthy; chills and fever seldom known, and that disease so fatal of late years in the Northern States, consumption, is hardly known here.

Bosque, Tex.—We need combination; a thorough, systematic preparation of the soil and rotation of crops, organization of agricultural clubs, and more mental and physical labor. We want united effort to develop the great natural resources of our country.

Santa Clara, Cal.—The principal cause of unprofitable farming in this and every county in this State is a total lack of any system in working the soil and a want of practical knowledge on the part of many, and a reckless disregard of scientific principles which should govern the cultivation of the soil; also, a disregard of rotation and variety of crops. Two-thirds of the farmers purchase all the vegetables for table use from peddlers who bring them to their doors; buy most, if not all the ham, bacon, and fresh meat used in the family, and one-third, at least, purchase at the country store their butter and eggs. The large majority purchase their potatoes for winter use, and very many buy the most of their hay and all their grain for feed. Such is farming in California, a country possessed of the richest soil and most salubrious climate in the world, capable of growing almost every variety known in the vegetable kingdom.

Campbell, Tenn.—I would suggest the forming of farmers' clubs, the circulation of good agricultural papers, the building up of good agricultural schools, and the keeping of careful farm accounts, that the farmer may know what he made or lost and what crop pays best.

DEBT AND EXTRAVAGANCE.

The tendency to extravagance in times of high prices, and to the entanglements of the credit system which are so ruinous on the recurrence of "hard times," is bitterly inveighed against, and its consequences portrayed from observation and experience of the harships which involve so many farmers at the present time; and the poverty resulting from war losses is a subject which causes much lamentation.

Spottsylvania, Va.—When the rebellion ceased three-fourths of the farmers were in debt. The slaves being set free, the creditors induced farmers to give them deeds of trust upon their lands, and the farmer, to get a little longer lease for a home for himself and family, consented, for about one-fourth the market value of his lands. If the cred-

itor can find sale for the land to the amount of the mortgage he will sell at once and leave the farmer and his family homeless. This discourages the farmer from making improvements that he would otherwise make, and these old debts will never be settled because there never will be purchasers enough for so much surplus land. If Congress in making a bankrupt law had included deeds of trust or mortgages, as they did executions and judgments, giving the farmer a small homestead, and let the balance go to his creditors, agriculture would then prosper in Virginia. We have a soil easily improved and a climate unsurpassed.

Franklin, Ala.—The Southern farmer will anticipate his crop, that is, he will spend it before he makes it. This almost universal habit is a blight upon all our industry. It affects both white and black, and keeps us all trudging with despondent feet the path of poverty.

Greene, Mo.—Scarcity of money, caused by buying four dollars' worth of goods for every three dollars produced. Money was plenty here during the war, large amounts being paid out for supplies at enormous prices. Then followed a large immigration, which kept the prices of produce up and brought a great deal of money into the county; these sources finally failed. But we had got into bad habits and lived as though there was no end to the supply. The only remedy I can suggest is for people to live within their means; come down to the fact that to have a dollar it must first be earned. That system alone pays in farming, and when we come to that we are all right, having a good country, fine climate, healthy, well watered, rich soil, etc.

Harris, Ga.—Another reason why the farmers do not succeed is because they buy supplies, implements, and fertilizers on a credit and give an exorbitant rate of interest. For example, in July or August a planter wants 1,000 pounds of bacon and 50 bushels of corn; the bacon sells for cash at 11 cents and the corn at $1. He buys on a credit till the 15th of October or 1st of November, and gives 18 cents for bacon and $1.75 for corn, and then gives a lien on the crop and on everything else he has, binding himself to pay all lawyers' fees and the expenses of selling him out. What an enormous percentage for only a few weeks, or months at most; about 300 per cent. per annum. The remedy is to abolish liens, and go on the cash system; do away with middle-men; let every neighborhood have a well-organized society and have an agent of their own to buy and sell, or each one do it for himself.

Our correspondent at Barnwell, South Carolina, says that "where there is a reasonable amount of industry and diligence, though a small proportion of science and skill, the results are satisfactory;" and statements of a similar tenor are frequent from that region. In Pitt, North Carolina, our correspondent expresses the hope that farmers will become independent enough to resist the temptation to cultivate cotton exclusively, and adopt a system of rotation, and secure higher ultimate profits. He says they need examples; that "there is a powerful sight of preaching, but little practice; but the revolution is progressing, and the welcome and restorative system comes apace." In the younger States the curse of pioneer farming prevails. "The farmers are shiftless pioneers, found on all frontiers," says our correspondent for McDowell, Missouri; and this county does not appear to be worse in this respect than many others. "Laziness and unscientific farming" are twin evils in Butler, Kentucky, but they are not found there alone. In Obion, Tennessee, "laziness and ignorance" are the only causes of discouragements in a region where "nature has been kind," providing "a rich soil and salubrious climate." To "ignorance" and want of industry is charged the shiftlessness of many neighborhoods; and the remark of the Orange (Florida) correspondent is repeated with variations in all sections of the country: "The great difficulty is that our farmers as a class are not a reading people, and are prone to follow in the footsteps of their fathers."

There are localities, in different sections of the country, in which the unsystematic and unprofitable methods employed in agriculture are partially realized, and in which aspirations for improvement begin to be felt, while the lethargy produced by comparative poverty prevents any general effort toward amelioration. The following case is an example:

Perry, Ind.—Our farming-lands in this section are completely worn out, our improvements upon them going to decay; our farmers are without resources; diseases

in their worst forms are many and severe, and most of them remain here because they must. We hear from all sides the cry, "The old way of farming will not pay." We must resort to rotation of crops, we must underdrain, use commercial fertilizers, apply green manures, etc. The plans proposed by the scientists, and all the others advocated, take it for granted the farmer is in a condition to make the necessary outlays; but here is the trouble; our farmers are too poor, too helpless, to adopt the proper system of farming. The question arises, then, how is he to be placed in a condition to do it?

SELF-RESPECT IN AGRICULTURISTS.

Many correspondents protest against degrading the character of agricultural exhibitions by offering the principal premiums to jockeys, and demand higher and more practical aims; and one expresses the disgust he feels at the want of self-respect exhibited by agriculturists in the following terms:

York, Me.—The business has fallen into disrepute primarily because farmers consented to be patronized. When a man accepts a patron, and is guided by his counsels, he so far surrenders his equality and independence. Farmers have allowed jockeys to control agricultural societies; selected ministers and judges to lecture upon practical farming; permitted theorists and charlatans to speak in their name through their press; submitted to detraction and ridicule, sometimes cringingly. Men seeking notoriety, money, or office have crowded to the front, assumed the name while they scorned the burdens of the farmer, deceived some by bluster or sophistry, silenced others by denouncing them as old fogies. The public have mistaken the silence for acquiescence or ignorance, and inferred that farmers, as a class, have sadly degenerated. If the doctors should call a medical convention and give up the business to lawyers or farmers, we should conclude that they thus acknowledged their incompetency.

ENCOURAGING SIGNS.

The evidences of poor farming are by no means new. An encouraging feature of these returns is the indication of an awakening in methodical and scientific agriculture. Incidental references to improvements are numerous and gratifying. The necessity of more attention to the subject of rotation of crops, of greater thoroughness in the preparation and cultivation of the soil, of judicious liberality in outlays for permanent improvement, of more attention to restorative farming by means of the consumption of products by live stock, is acknowledged in all quarters, and beginnings of such improvements are everywhere reported. Among these references are some showing that even tobacco-culture in Virginia, to which the soil-deterioration in that State has always been charged, can be continued with benefit to the soil.

Fluvanna, Va.—I know many interesting cases in tobacco and wheat growing, among farmers whose lands were light and dry, and considered poor, who have regularly made good crops and improved their farms and their condition, while their neighbors, on good lands, were losing money.

Forsyth, Ga.—With a few years' cultivation, the land failed to produce as freely as at first, and farmers were accustomed to clear fresh land every few years, but more recently they are giving more attention to modes of culture, fertilizing and renovating old and worn lands; and by this and deep plowing, the farmer is learning that it is not so much the area worked, as the manner of preparation and cultivation, that remunerates him for his labor.

West Feliciana, La.—Six and a quarter acres of ground were highly manured with green cotton-seed and sowed to spring barley in 1871. In 1872 the ground was plowed and subsoiled in April, 200 pounds soluble Pacific guano per acre being applied in the drill, as deep as possible. Cotton planted May 1, but did not come up till June 1, owing to drought. The usual cultivation was given, and the crop grew rapidly. About the 15th of August the caterpillar appeared, and by the 10th of September not a leaf could be seen, the stalks hanging with bolls in various stages of growth, at least one-half being under half grown. The yield was 3,600 pounds of lint-cotton, which sold for 20 cents. But for the caterpillar the yield would have been at least 4,800 pounds lint.

Russell, Ky.—After having quit farming for twenty years, I returned to my place three years ago. By using the manure from the barn-yard, and by deep and thorough culture, I am raising at least 50 per cent. more grain than was produced before I came to it.

The Cumberland (Virginia) correspondent mentions a notable case of improvement of badly worn, apparently worthless soil. In a twenty-acre field were four acres "perfectly bare, except stunted bunches of hen-grass." On this he spread refuse tobacco-stalks, and in the autumn scattered five bushels of lime per acre, and plowed under, and sowed winter oats, one bushel per acre, harrowing to a fine tilth. In spring, after applying lime in quantity as before, the oats were plowed under, and one month later peas were sown, five pecks to the acre, and again, when the ground was well covered with vines, an application of two bushels of lime and one of salt was made, and the pea-vines turned under. On the 20th of September wheat was sown, five pecks per acre, with one gallon of clover-seed. The result was 60 bushels of wheat, or 15 bushels per acre. The pecuniary result was as follows:

EXPENSES.

Plowing, (50 cents per day for plow)	$8 00	
Harrowing	4 00	
Seed oats, (4 bushels, at 50 cents per bushel)	2 00	
Seed peas, (5 bushels, at $1.50 per bushel)	7 50	
Lime, (48 bushels, at 12½ cents per bushel)	6 00	
Seed wheat, (5 bushels, at $1.50 per bushel)	7 50	
Harvesting crop, (at $1.75 per acre)	7 00	
Thrashing, (at 9 cents per bushel)	5 40	
Six hundred pounds Aber's guano, (150 pounds per acre)	18 00	
		$65 40

RECEIPTS.

Credit by 60 bushels of wheat, at $1.80 per bushel	108 00	
Amount of straw and chaff	12 00	
		120 00
Profit		$54 60

The farmers of the portions of Texas subject to drought are canvassing for a remedy, and a correspondent makes the following suggestions:

Atascosa, Tex.—I have one suggestion to make, *i. e.*, to plow the land in the early fall to the depth of one foot or fifteen inches; subsoiling will still be better. I wish some of our northern neighbors would invent some plow to suit our dry seasons. We have many plows, but none to suit our soil or seasons. We very much desire a plow high in beam, very heavy in moldboard, cast with steel points. Unfortunately our cast plows have been badly furnished with points, and many are laid aside for this want of points.

TRANSPORTATION DIFFICULTIES.

The excitement relative to high and discriminating rates for railway transportation is intense throughout the West, and the subject claims the attention of correspondents of nearly every State. The watering of stock, the fictitious increase of capital by numerous dishonest expedients, and the assumed necessity of paying dividends on this spurious capital, meet the severest denunciations of farmers who deem themselves plundered by an interest that could not exist without the products of agricultural industry, and which was itself built up through the aid of the Government, and for the development of national resources. The feeling is generally one of indignation at manifest in-

justice, and calm determination to use legal and legislative methods to remedy the abuse, with occasional outbursts of threatened violence as a dernier resort. The demand is universal, both for legislation to secure justice in the case, and national laws to prevent undue and prohibitory discriminations between rates of local and through freights. Double-track freight-railroads to the sea-board, either owned or directly controlled by the Government, are demanded by many, to be run in the interest of the people, and not for excessive profit and extortion. Water-routes for cheap transportation are also desired.

The farmers appear to be thoroughly aroused, and they have the power, rightly used, of enforcing their demands. It is important for their own good and the welfare of the country that they stand firmly for all that is right and submit to nothing that is wrong.

While it is true that the cost of freight is a burden, and that the injustice of railway extortion should be remedied wherever it exists, it does not follow that the "hard times" of which the western farmer complains are due exclusively to excessive railway freights, or that any reduction of freights would insure high prices and satisfying profits. The main causes of low prices are overproduction of certain staples, lack of variety in agricultural production, want of home markets, and the need of a withdrawal of western labor from the farm to the workshop and manufactory. This is the view of our most intelligent correspondents, and a truth which must enforce itself upon the belief and practice of the West, or low prices will be lower and hard times harder, even if railways should carry at cost, and all local and national taxation should be remitted. The following extracts, a few selected from hundreds, embody most of the various suggestions presented on the subject:

Kent, R. I.—I know that the most active and intelligent minds among the people, whether producers or consumers, are agreed that, before any permanent good can result to the farming interest, we must have several lines of communication (transportation) opened with the far interior of the country, to be built and controlled entirely by the Government, with the rates of transportation fixed so permanently, and at such prices, as will insure to producers at the West entire exemption from the uncertainties which always attend private corporations. When the Government gives us these things it will have done for the farmers something equivalent to what they have been doing for the industries of the miners, the workshops, and the mills, ever since the Government was organized. The produce and grain exchanges of our commercial cities, in combination with the great lines of transportation, now fix for us the price of nearly every pound of flour, corn, and meat that goes upon our tables.

Wythe, Va.—On account of what is called a discrimination between *way* and *through* freights, it costs as much to market cattle, sheep, hogs, or grain, from here to Baltimore as it does from Memphis, which is three times as far.

Frederick, Va.—It costs as much to send a bushel of wheat, corn, etc., to market as it does a farmer who lives five hundred miles west of us.

Freestone, Tex.—Cheap freights will almost entirely revolutionize farming in this State, as it now costs nearly as much expense to ship all kinds of esculents, grain, etc., as it does to produce them, thus depriving planters of a ready market.

Lake, Ind.—Co-operation or combination of farmers, if managed judiciously, may, to some extent, influence legislation in regard to rates of freights for transportation, but the thing of most immediate importance is more railroads, and double tracks, between Chicago and the eastern sea-board. The whole West has for years been filling up with railroads and producers to an almost limitless extent, while for the last twelve or fifteen years hardly one single facility for transportation has been added between Chicago and the East. More facilities and competition is what is most wanted.

Richland, Ill.—I would suggest as a remedy, a full execution of the laws of the State. The State has made wholesome laws in regard to common carriers, and appointed three commissioners to attend to overcharges on freight. When a complaint is made to any one or all of these commissioners, *the reply usually received is a copy of the law in regard to railroads*, and the matter ends there, unless the shipper enters a suit against the railroad company, when he is taken through a full course of law, and, although he beats the railroad company in the suit, his loss by attorney's fees, of time, etc., amounts to more than what he gains: the result deters many from a suit, and the railroad company keeps on charging as high rates as ever. As an

Illustration: D. Scott & Co., of Olney, are large shippers of eggs to New York City. The freight on a barrel of eggs to Vincennes, thirty-one miles from Olney, is as much as from Vincennes to New York City, nine hundred and thirty-six miles. At Vincennes there are two roads leading east, one via Indianapolis, one via Cincinnati. D. Scott & Co. have been at law with the Ohio and Mississippi Railroad for the past fifteen months, and the prospect is that it will not be settled in the next fifteen months. If the farmers would combine and raise a fund to oppose the railroad companies, it might do some good, provided the suits did not drag too slowly through the courts, or the railroad-trains quit stopping at our stations, as they have done at places on this railroad.

Mower, Minn.—The farmer has no chance, for as soon as there is an advance of any importance in the eastern markets the railroads raise their freights to correspond with the advance.

Kankakee, Ill.—The cost of sending a bushel of corn to Chicago, a distance of but fifty-six miles, is 10 cents. Price paid for same here (Kankakee) is 22 cents. Unless some power controls these monopolies the people will assert their rights by other means than by legislation. They are creating a magazine by their exactions and persistency that must explode some day when they least look for it. The people of the State, not *farmers alone*, are now organizing to protect themselves, and they will do it.

Olmsted, Minn.—It costs us more to send a bushel of wheat from here to Winona, sixty-eight miles, than it does from Mankato to Winona, one hundred and thirty-five miles. Now, it is plain that if it is worth but 8 cents to take it one hundred and thirty-five miles, it cannot be worth but 4 cents to move it sixty-eight miles. We pay 10 cents to take it sixty-eight miles. Interests are conflicting, and a war between them not only probable but imminent. Either will admit this view to be wrong and detrimental to their interests, but I suppose neither will retire while the other is on the war-path. Voluntary submission by both to fair legislation on the subject of freights and tariffs would certainly be a great improvement over our present overcharging and unsatisfactory manner of exchanging our products and manufactures.

Beaver, Iowa.—These corporations have been built up, fostered, encouraged, and supported by our national and State governments, enriched beyond measure by grants of the people's property, until with hundreds of millions of stock, inflated or otherwise, they seek to bribe every department of the Government, and consume the remaining substance of the people. Our legislators are bribed and their mouths stopped by free passes on all these roads; the publishers of our journals throughout the State are silenced in the same manner; and no voice is raised in sympathy for or defense of the masses, or against these engines of oppression which are crushing out our existence.

Hardin, Iowa.—A man by the name of Merry actually demonstrated, a few years since, that wheat could be shipped as cheap from Dubuque to Liverpool, via Mississippi River and New Orleans, as to New York. A company was formed and warehouse erected in New Orleans, and then—we were disappointed. Chicago saw it, Chicago felt it, and Chicago bought Mr. Merry off by giving him certain transportation monopolies in Chicago itself, and thus ended Mr. Merry's practical scheme. Not so, however, Mr. Merry himself—he grows richer and richer, and cares not a fig how wheat gets to New York or Liverpool so that he reaps his transportation profits in Chicago.

Green, Wis.—Freights from Monroe to Milwaukee have gone up from $20 per car to $35, which is an addition of 75 per cent.

Green Lake, Wis.—I would suggest that Congress regulate the railroads. Give us an appropriation for the Fox and Wisconsin River improvement, and open water communication between the East and West; or that western people manufacture their own goods and consume their own productions.

Carver, Minn.—There are many railroads in this State that refuse to ship the produce of farmers, in order to give speculators a chance to make money in combination with the officers of the railroads.

Henry, Ill.—If the Agricultural Department would aid in urging Congress to lend its aid in constructing a double-track railroad from the Mississippi River to the sea-board, say New York, with a charter compelling said railroad to carry freight at a uniform and reasonable rate, this would of itself compel other railroads to carry at nearly the same rates.

Iroquois, Ill.—The principal cause of discouragement is the combination of railroad companies to collect from one-half to three-fourths of the proceeds of our crop to carry the remainder to the consumer. The General Government must encourage manufacturing interests in the west, by this means bringing the consumer to where our corn, beef, and pork are raised, and regulate the charges of carriers either by competing lines or statutory restrictions in charges.

Jasper, Iowa.—I would suggest that one grand trunk double-track line of railroad be built from Chicago, or some other point on Lake Michigan, to the sea-board, owned, run, and controlled by the General Government, also another on the great Mississippi River to some point on the sea-board of some southern State, say North or South Carolina, transportation to be fixed at the lowest paying rates.

Mahaska, Iowa.—It costs to-day four bushels of corn to carry one bushel to New York, whereas, if the railroad business was *honestly* managed, it would require only one bushel to take another there. There is no remedy for this trouble this side of the halls of Congress at Washington.

Tama, Iowa.—Hundreds of thousands of acres are, and will continue to be, brought into cultivation each year, in the West and Northwest, far more rapidly than markets for products are apt to increase. The high freight-tariffs on railroads almost exclude western farmers from the markets of the world.

Grundy, Iowa.—Railroad tariffs are almost double what they were when most of us came here to settle. We must abandon raising wheat in this great grain-field of the Northwest, and the world must look elsewhere for food.

Ripley, Ind.—The great trouble with us is that we have to pay as much freight from here to Cincinnati, fifty miles, as they do from Vincennes, one hundred and twenty miles west of here; and why? Because at the latter place there is another road to Cincinnati, hence there is competition; here there is none.

Saint Louis, Mo.—Causes of discouragement are high prices of land, high prices of labor, high taxes, general advance in prices of all articles consumed on the farm, and comparatively low prices of farm products. I can conceive of no remedy except cheaper transportation to the sea-board.

Mississippi, Mo.—The greatest cause of discouragement to farmers is at this time the very low price of corn and the very high price of railroad transportation. At this time, Atlanta, Georgia, and Mobile, Alabama, are our best markets for corn, to transport which to either place the railroad companies charge 39¼ cents per bushel; sacks, storage, and commission cost 13¼ cents per bushel, which, taken from 85 cents, leaves 32½ cents per bushel to the producer; showing that the railroad companies receive 6¾ cents more per bushel for carrying the corn some seven hundred miles to market, than the farmer does for raising, shelling, sacking, and hauling it to the railroads.

Nemaha, Nebr.—It costs us an average of 68 cents per bushel to transport corn to New York; it sells here at 15 to 18 cents per bushel. If we save the freight on one bushel it is equal to raising four. Farmers must refuse to sell grain or stock when the price is below the cost of production.

Montgomery, Kans.—At the rates now charged, a farmer shipping 100 bushels of corn from this county to Chicago, our best market, and selling at the market price, would not have money to pay the freight, but would actually come out considerably in debt.

Johnson, Kans.—Suppose railroads reduce freight on corn one-half their present price, there would be such a quantity thrown into the eastern markets that the price would fall there in proportion, so that we would receive but little benefit.

Minnehaha, Dak.—Farmers look to the Agricultural Department to impress this view upon the minds of our Congressmen—that it is useless to try to stimulate the agricultural energies of the far West while it takes three bushels of corn to send one to market. Such has been my experience while in the country.

Napa, Cal.—Fruit-growers are discouraged by having a market limited to San Francisco, while the markets of the eastern cities would be open to them but for the high freights of the transcontinental railroads. Grape-growers would gladly sell Muscat and other choice varieties of table-grapes at 2 cents per pound at their vineyards, and eastern cities would cheerfully pay from 10 to 15 cents (wholesale) in their markets; but high freights keep the producer and consumer apart. Grape-growers complain also of adverse legislation in Congress, by which the waste of their crops cannot be utilized by conversion into spirits. On these accounts the vineyard interest languishes.

Placer, Cal.—The farmers on the Pacific coast are sorely pressed by a monopoly too powerful, we fear, for our efforts to overcome. I refer to the railroad monopoly, combined with the San Francisco grain-ring. The number of men in these two monopolies does not consist of over one dozen, yet they have such a combination that we farmers are entirely at their mercy. The railroad monopoly owns every mile of railroad in the State, and have purchased all the steamers and freight vessels on our rivers, and hence they have the entire carrying trade in the State, and now charge double for all freighting they do. The railroad monopoly and grain-ring have swindled the farmers this year, in freights and purchasing our grain at less than it was worth, over $12,000,000 in this State. Our only hope of relief is that Congress will regulate the price of freight on the railroad which was built with Government money. That power once broken everything else will regulate itself.

Sonoma, Cal.—Our wheat-raising farmers have much to contend with. As wheat cannot be exported in bulk the farmer is compelled to pay on an average 10 cents per bushel for sacks, which aggregates quite a tax on him. Then the local railroads, by a high tariff of freights, extort all they can from him; thus, from this place to deep water, fifty miles, the rate of freight is $5.50 per ton of 2,000 pounds. Then speculators in San Francisco, charter, in advance of arrival, all the ships on the way to that port, then raise rates of freight 100 per cent., and finally wind up by buying the farmers' wheat at their own price, often not enough to pay all the expenses of its cul-

tivation. The want of co-operation among farmers has been a serious evil. An effort is now being made to organize "farmers' unions" throughout the State; with what success remains to be seen; if successful, it may result in great benefit to our farmers.

HOME MARKET AND MANUFACTURES.

A few extracts from correspondence will suffice to show the tone of their communications, as the subject is one upon which there can scarcely be a division of opinion:

Pickens, Ga.—We have one of the finest counties in the State, abounding in iron ore, marble, inexhaustible, never-failing water-power. All we need is to have our resources developed. But we are left too poor, and capital follows the line of travel westward, while untold millions lie embosomed in our own soil.

Jackson, N. C.—Our present want is a home market for heavy products, such as hay, potatoes, apples, cabbage, &c. Transportation lines of railway, the opening of our rich veins of copper and mica, or the development of manufacturing industries at the falls of our rivers, would give to agriculture a great impulse.

Union, Tenn.—Our farmers are discouraged for the want of home markets. We need railways. We are rich in mineral, timber, marble-quarries, and also have a considerable surplus of farm products.

Humboldt, Iowa.—We need a home market for surplus products. Stock-raising should be increased. We should have more mills, more factories, more machine-shops, and a more diversified industry to remedy the evil.

Union, Pa.—The cause of discouragement is the small yield of wheat, the low prices of corn and oats, and the high prices for labor and agricultural implements, and what the farmer has to buy generally. Remedies would be, more enterprising men to start up factories, furnaces, &c., for we have plenty of iron ore in this county; a cheese factory and canning establishment, which would give an opportunity to raise more fruit and garden truck, and afford a market for the same.

Fayette, W. Va.—We want energetic capitalists to build factories and develop the resources of our county. We have fine timber, good water-power, coal, and other minerals in abundance. We can produce nearly all the fruits and vegetables suited to our latitude.

Washington, Wis.—The farmers of this county are very little affected by the high charges for freights of railroad companies, as is the case further west and south of us. We live near the best markets of this State, and make but little use of the rail.

Clark, Ill.—My only hope of remedy is for the eastern manufacturers to move to the West where their bread and meat are raised, and divide what is now paid for freight both ways between themselves and the farmers. They can get their cotton delivered just as cheap in Illinois as at New York or Boston; they can get their wool much lower, and the hides for their boots and shoes for about one-half, and save 100 per cent. on their bread and meat, and still give the farmer much more for his products than he gets now.

Sangamon, Ill.—The establishment in our midst of manufactories to work up raw material, thus increasing population and creating markets at home, and resulting eventually in a greater diversity of farm products, is our great want.

Ford, Ill.—Although cheap freights would help us, the building of factories is what we most need, and the farmers hail them with joy wherever they spring up.

Putnam, Ill.—Increased facilities for getting our products to markets by means of water and railroad communications are needed, and a home market created by diversity of industries, particularly by building up manufactories among us. Combinations at present suggested are farmers' clubs and granges for discussion of the situation, and taking action on the results arrived at thereby. And one of the results will be that farmers will not long submit to being oppressed by the moneyed monopolies of the country.

Peoria, Ill.—We need more population and more capital, and we need to have them devoted to manufactures, mining, ship-building, and navigation. This will give us not only an American market, but, throughout a large part of the country, eventually, a home market, thus solving effectually the question of transportation, and doing away with the necessity for combination. For the purpose of fostering these interests we must have a liberal, uniform governmental policy.

Cherokee, Iowa.—I think that home manufactories are needed. If we had woolen factories it would pay to raise sheep, as the country is well adapted to that purpose, it being dry and healthy, and we have good water-power for manufacturing purposes.

Jefferson, Iowa.—Let the farmers of each county encourage the establishment of manufactories of all kinds at the county-seats, and for which they can supply a large proportion of the raw material. These will give them a home market for the raw material and an increased home demand for their produce. Instead of forming granges

to buy goods and sell produce thousands of miles away, establish factories and produce the one and sell the other right here at home.

Logan, Ohio.—It may be said that the raising of grain, whether it paid or not, has been the one steady, unvarying feature of our farm arrangements. Notwithstanding the extra labor incurred, the expense of seed, and above all the impoverishing of the land, we still adhere tenaciously to those productions which, although they may not pay, always find a ready market at some figure. And *there* may be the secret of our persistent adherence to the practice. The old saying, that a home market is the best market, would, if it were possible to carry it out in practice, obviate most of the difficulties against which our farmers have to contend. The remedy is not to disconnect ourselves from manufacturing countries by ceasing to use their manufactures, but, by encouraging such industries in our midst, establish home markets for our own productions.

Martin, Iowa.—This county is underlaid with iron and coal; it has large forests of valuable timber, and immense deposits of valuable stone, freestone, limestone, and grit, together with soft, clean sandstone, suitable for glassware, and, in addition to these, about thirty miles of the finest *water-power* in the western country. If these now almost neglected sources of wealth were properly developed our discouraged farmers would reap their share of the general advantage. There has been considerable machinery erected in the county during the last few years, several mills, stave factories, hub, handle, and shingle factories, and one blast-furnace, and the produce market has thereby been materially improved.

Douglas, Kans.—Increased facilities for shipping West is near at hand, and also South, to the sea-board, at Galveston, Texas. With this commences a beginning of manufactures in Kansas. A dam is in process of construction across the Kansas River, in Lawrence, for cotton-mills, and woolen factories, and flour-mills, so that the cotton of Texas and the New Mexico wool may soon be made into cloth at our own doors.

Newton, Mo.—Last fall a good pair of heavy winter-boots, suitable for a farmer, was worth $6; oats were worth from 15 to 20 cents per bushel; hence, to get a good pair of boots, a farmer had to give from 30 to 40 bushels of oats. I think it would be better for farmers here if the county produced at home more of the articles we consume. Last fall we sold a fat beef for 2 cents per pound, gross; the hide was shipped, perhaps, to Boston to be converted into boots and shoes, and then shipped back to us to be sold at an enormous profit to all whose hands it passed through.

Orange, Ind.—The remedies are simple and certain. Let the farms rest, and the farm laborers go to work in the manufacturing establishments.

Caldwell, Mo.—In my opinion the want of a home market for the products of our farms is the base of all the difficulties. Any form of co-operation that will give us manufactures, vary our industries, and prevent the sending of our money out of the county, or any combination that will improve our stock and improve our methods, will be beneficial.

GREATER VARIETY OF PRODUCTS.

A few extracts from the suggestions under this head must suffice:

Putnam, Ga.—Every one seems to understand that it would be better for all to plant less cotton and more small grain, but none are willing to practice it themselves.

Titus, Tex.—The great cause of discouragement is the almost universal direction of labor into the corn and cotton channel, making us dependent on other people for everything except our corn-bread. The remedy is patent—diversity of labor and product. Our soil and climate are congenial to all sorts of products, and we shall bless the man or means that can bring our people to a sense of their own best interests on this point. There can be no reason why we should be slaves to other people for the supply of our wants when we have the means at our own doors; but "cotton is king," and until he is dethroned we must be his suffering subjects.

Queen Anne, Md.—While corn continues at so low a price as to cause much to be used as fuel, and while the grain we *export* does not pay for the sugar we *import*, I can see but little hope for improvement. It is absolutely necessary that a considerable portion of the labor and capital now employed in growing grain, to still further depress a glutted market, should be diverted to the production of beet-sugar. The statements and arguments of your annual report for 1871 (page 298) are enough to convince any reflecting man of this fact. If private enterprise cannot effect this, let Government aid be granted; not, however, upon exorbitant tariff duties upon an article of prime necessity, which has become so essential to the comfort of every workingman's family, but in the shape of a *bonus* to the successful producer. I think that such a system would, in a few years, render beet-sugar factories self-sustaining. Thus, by retaining in the country $75,000,000, now sent away for sugar, and also by diminishing the production of our great staple, Indian corn, relieve our markets of that constant glut which now causes its production to be only profitable to railroad companies and commission merchants.

Fayette, Tex.—Up to 30½° north latitude we have as fine a sugar-growing region and climate as could be desired, and now that cheaper modes of manufacture are brought to notice, through the introduction of sorghum, small planters and men of limited means can turn their attention to this staple profitably.

Clark, Miss.—Much might be accomplished by an association of planters of each township, or of the whole county, to be called the "Experimental Association," offering premiums to any member of the association that should, by an experiment on a given amount of land, produce the largest crop of wheat, rye, oats, barley, grasses, or any other kind of crops not generally grown in the county. Such a course would lead to a discovery of such untried crops as would yield well, the kind of land suited for such productions, fertilizers, &c.

Henry, Mo.—In 1868 many thousand acres of wheat were sown in this county, the seed costing $2.50 per bushel. The crop gave splendid promise in May, but rainy weather set in May 26, continuing to July 4, keeping the straw green about fifteen days after the ordinary time of harvest. This cut the crop down to an average yield of about 17 bushels, while not less than 30 bushels was confidently expected. The crop was sold at from 70 cents to $1 per bushel. It was claimed that the price realized only paid for the outside, or hired labor, and the farmer received no compensation for his labor or use of land. In 1870, 1871, and 1872 it has again been tried, with loss, in almost every instance caused principally by the attacks of chinch-bugs, and the price has improved but very little. Low prices must continue so long as railroads continue to charge double rates west of the Mississippi, as compared with the East.

MIDDLE-MEN AND MONOPOLIES.

Middle-men, although not producers, are necessary and useful in their legitimate sphere; but they become, when using their facilities for combination to depress prices of products in first hands, a terrible scourge, often taking, for a small service, more than half the market-value of a commodity, and leaving for the producer less than the cost of production. This evil was treated fully in the annual report of 1870, but a glimpse of it as it exists in 1873 is given from our returns:

Middlesex, Mass.—The discouragement of farmers arises from the presence of middle-men, who absorb an undue proportion of the profits. As society is at present constructed, these seem a permanent evil, for farmers cannot combine over a sufficient extent of territory, or for a long enough time, to influence the markets. The milk-producers have made the attempt, and the effect has been to extend the area of competition. The wholesale-men buy milk at remote stations on the railroads, where the cost of raising it is less than here, and thus force the price; and railroads carry for them under contract, and will not take individual cans at the same rates for our producers. When hay is $35 per ton, and land and taxes correspondingly high, even six cents a quart, with average cows, will constitute a loss. When land is low in value, and hay $8 or $10 per ton, 3 cents a quart for milk may give a profit to the producers. Thus—average yield per cow, 1,300 quarts, at 6 cents per quart, is $78. The cow eats the equivalent of three tons of hay a year, at $35 per ton, $105. Loss, $27. Again, 1,300 quarts, at 3 cents, $39; 3 tons of hay a year, at $10 per ton, cost $30, leaving a profit of $9. However, the farmer nearer the market, and subject to a greater competition, necessarily keeps a lot of dairy cows far above the average, and this theoretical difference would not hold. The effect of this competition has already forced the sale of dairy stock in some neighboring towns, and a change in the system of farming.

Sussex, N. J.—Another cause of discouragement among farmers is the way they are robbed by middle-men. For example: the farmer does all the hard work in seeding the land, gathering the hay, pasturing, foddering, and stabling the cows, and in milking them and delivering the milk at the railway-station. He gets for this, on an average, between 3 and 4 cents per quart, while the parties to whom he sells, with but little trouble, dispose of it at 10 cents per quart. The farmer remains a poor man, or only makes a comfortable living, while the other realizes a fortune in a very few years. Again, the milk delivered at the depot does not all reach New York, as thirsty laborers and railroad employés regard the cans as public property, and the loss from short measure is charged to the farmer, who also has returned to him as "sour" what the New York man may be unable to dispose of in summer when milk is plenty.

Richland, Ohio.—The capital causes of discouragement are found in the rings, cliques, and combinations among speculators and middle-men, from the buyer on the street, up through the entire chain of harpies, to the gigantic railroad monopoly; the last mentioned of which nothing less than the strong arm of Government can successfully grapple with. From the pea-nut boy at the street-corner, up through all the varied

ramifications of trade and commerce, we believe an organized scheme exists to force upon the farmer (in common with others) the highest possible prices, while at the same time, by the force of this organized scheme, to compel him to take the lowest figure possible to extort from him for what he has to sell. After this manner does this ruinous railroad combination swindle us all in common. All we ask is a fair field and no favor. Let us have healthful competition, and then give the law of supply and demand full swing, and we are satisfied to take our chances in the great battle of life. But, in the name of our common humanity, we do protest against organized robbery. At our county-town, which is our main market for farm products, we have two firms who are produce dealers, that is, grain-buyers. But there is no competition between them. It is a combination, and it matters not which party makes the first bid; the other never overbids, but they divide the spoils of each day between them amicably. Hence you see, by thus combining, they compel the farmer to take whatever price they may choose to offer, or haul his grain home again, to be treated in the same style at any future time he may appear in the market. Thus is the farmer taken by the throat and ordered to "stand and deliver," after the manner of highwaymen, with this difference, that in the *latter* case you have a chance for your life, but in the *former* none. The thirty or forty groceries in the town have adopted the same system of tactics, but their blade cuts both ways. They are combined to fix the price of butter, eggs, garden products, and the small fruits, and no one is allowed to pay more than this *caucus* price, but as much less as he can. So if you go the round of the groceries after the first offer you cannot get a higher bid. But while you are compelled to take what they choose to offer, you are also forced to pay the established combination price for what you purchase. Thus the grocery-ring doubly robs the farmer. I care not where you go, whether to the cobbler or the locomotive-builder, and to every trade and mechanic art between, whether to the pop-corn boy or to the wholesale merchant, or to any branch of trade between the two, and you will find that they all know to a penny just what their wares are worth, and are allowed to fix this price, and if any body objects they combine to compel it. But how is it with the farmer—without organization, without combination—single-handed and alone, a static anomaly—a target for any or all of the legion of harpooners!

Franklin, Ind.—We are not paid for our labor. Our products are mostly below cost. We are the victims of powerful combinations; railroads eat us up with freights both ways. Pork-rings dictate the price of our pork with an absolutism against which we have, as yet, found nothing to oppose. They bought our hogs this year for just what they chose to give, from 3¼ to 3½ cents per pound, and when the market was over they run it to 5 and 5½ cents, and boasted to our faces of their power to do this.

De Kalb, Ill.—Aside from dairying and wool-growing there is scarcely a farm under the best of management paying more than to cover the expenses of production and working, saying nothing of the interest on the money invested in land, fixtures, implements, and taxes. The sharp practices of those who handle, as middle-men, the products of the farm, operate continually against the interests of agriculture.

Will, Ill.—Another great cause of dissatisfaction among farmers is the gambling on the price of grain by the boards of trade in large cities, which has the effect to take too much of the produce to pay for the handling between producer and consumer.

Butte, Cal.—The causes of discouragement existing among farmers are monopolies which completely block every avenue between them and their market. During the past year grain-sacks, ocean tonnage, and inland transportation fell into the hands of combinations and rings. There is another cause which may discourage some, the glaringly apparent decrease of production by continual cropping; intelligent farmers must see it, but as yet no one stays his hand. As a remedy against monopoly farmers are beginning to organize into farmers' clubs, and to talk earnestly, and, in some instances, to subscribe to encourage the building of narrow-gauge railroads. But there is a deep and wide-spread feeling that the present powerful monopoly will crush or purchase everything in the form of opposition until the Government assumes and controls the railroads, at least the trunk-lines, in the interest of the people. The State government may possibly do something to regulate the rate of freight, but it is by no means certain, for the contest will be with a corporate power whose revenues surpass those of the State itself, and able, if so disposed, to make everything bend to its purposes.

Conejos, Colo.—An old Mexican land-grant has been sprung upon us, and, if approved by Congress, all the inhabitants of this, and about one-third of those in Saguache County, will be compelled to leave their homes and improvements, as the grant-holders propose selling to some of the railroad companies. The tract is about eighty by one hundred miles in extent. This uncertain tenure prevents permanent improvements, and induces the raising of so much stock, as it can be driven off if the claim of the grantees should be approved. Most of the inhabitants have lived here since 1854.

CO-OPERATION.

The subject of co-operation for the remedy of evils afflicting agriculture is presented in the following extracts:

Richland, Ohio.—We know of no better way, and, indeed, there seems to be no choice left us but to meet intellectual force with intellect, combination with combination, and plot with counter-plot. Every trade, art, and profession (except farming) is combined; and though the segregated location of our rural population is a powerful drawback to our movements in this direction, yet with us it is *combination* or *annihilation*. What we need is, first, light for the millions. Then we want action in the right direction, action for the development of the head as well as hand, combined action, mutual and determined.

Owen, Ind.—Co-operation among farmers for their benefit has never been, nor will be, secured in this country while they are led by politicians wanting their votes from purely selfish motives. Again, we as a class know too much individually to feel the necessity of acting together.

Wood, Ohio.—With the present low prices of grain, and high rates of transportation, the producers will be compelled either to abandon their farming business, or to form co-operative societies in every county, with a central head in each State, to obtain and disseminate information in regard to all crops, the probable demand for the same, &c. Also, to use some effort to counteract the influence of the immense combinations formed against the producing classes.

Brooke, W. Va.—Their produce has to pass through so many hands before the consumer gets it that the farmers get much less, and the consumer has to pay much more, than the value. For instance, fat cattle are sold to drovers for 4 cents per pound; the drovers sell to the butchers at 6 to 7 cents per pound, and the butchers sell to the citizens at 16 to 20 cents.

Seneca, N. Y.—In that word *combination* is embodied the chief cause of discouragement to the American farmer. Combinations to force up prices of labor, of manufactured articles, of interest on money, of salaries. Combinations to force down the price of farm products, to lay upon the farmer the whole cost of transportation. Combinations to exempt personal property from taxation; and combinations to steal the nation's purse after the Credit Mobilier fashion.

Jefferson, W. Va.—The best form of co-operation would be for farmers to combine and send farmers to Congress and the State legislatures, instead of so many lawyers and small politicians as are now put into such positions. This was fully illustrated in the late constitutional convention of this State, where there were *thirty-four lawyers in a membership of seventy-eight*, and we got a constitution made for the especial benefit of lawyers.

Sumner, Tenn.—They cannot feel encouraged to see other interests grow strong by reason of their close organization and extended combinations, while they, separated, spread out over a world of territory, must meet these combinations, backed by all the power that legislation can afford them. How this can be remedied is with us a most vexed question. Many there are who favor as thorough organization by counties, States, and national as is possible for so numerous a class, giving to the great central organization such powers as will make itself felt in the legislation of our country, and also exert its influence upon all other organizations and combinations.

Shelby, Ky.—Well-organized farmers' clubs in every agricultural district of the country, with an annual congress composed of one delegate from each club, would have a tendency to counteract to some extent the discouraging influence that now threatens to overthrow the best interests of agriculture. By this plan the voice of the farmer would be heard in the councils of the nation, their claims considered, and their grievances adjusted. Scattered, as they are, over a large expanse of country, without organization or co-operation, they feel themselves powerless to counteract any influence that is now working detrimental to their interest. "In unity there is strength," is a maxim felt and acted upon by every class of the community, save the farmer, who, by force of circumstances, plods along the pathway of life unaided and alone, a prey to every combination to feed and fatten upon his labor.

Rush, Ind.—And nothing short of a general organization of clubs as seconds to a close national organization, working in unison, will be effective. Numerically he has the power—only teach the will to act prudently in defense of his rights.

Calhoun, Mich.—Your correspondent has little faith in any form of co-operation or combination, except such as shall unite the surplus accumulations of the farmer and the business man in the erection and operation of such manufacturing establishments as will supply the community with indispensable articles of daily use and necessity, and thus save to the community the enormous tax they now pay to railroads for freight and to middle-men and manufacturers for profits upon such articles. For, while we now only furnish the raw material at a trifle above cost, not only would this vast expense be avoided, but the secondary effect would be scarcely less important in

the increased number of the non-producing class who would be cash consumers of the corn, wheat, meat, eggs, fruit, vegetables, butter, wood, &c., of the farmer.

Juneau, Wis.—If farmers would form combinations or associations, and appoint some of their best practical business men to sell their produce, instead of being sold in little lots and parcels, in this way paying prices might be obtained. Three-fourths of last year's hop crop was sold for from 18 to 20 cents per pound through the unscrupulous combinations of a few merchants and speculators, by their rings and corner operations.

Appanoose, Iowa.—I do not believe that combination or co-operation can cure these evils. Nothing but individual effort, good judgment, and hard sense, learned in the school of experience, will do it. We cannot legislate money into our pockets. Our western products must seek a market in a concentrated form, or middle-men and railroad freights will eat us up.

Clinton, Iowa.—The difficulties that farmers have to complain of are exorbitant freight charges, middle-men, and bad legislation. In our legislature every man is offered a free pass over the railroads, and probably not half a dozen refuse them; furthermore, the leading spirits in the legislature are lawyers, and the laws are made to foster litigation, otherwise their vocation would be gone. Our whole legislature is bribed to the interest of railroads, and a purging of it is needed. The fact is, our leading men, or a majority of them, the judges, lawyers, and leading politicians, all have free passes over every railroad in the State, and these have to be supported by the farmers, by hook or by crook. If the farmer could receive one-half the price the consumer has to pay, he would be much better paid than he now is.

Jackson, N. C.—If we had the moral sentiment to sustain and enforce the penal laws, millionaire thieves might in the penitentiary be turned to some benefit to agriculture. They could be taught to make plows, axes, and hoes.

Lawrence, Ill.—The farmers could perfect the most successful combination that ever was effected, if they would work together. Amid all the discouragements and difficulties there is a constant gradual advancement in the art of properly cultivating the soil—an advancement that is clearly seen each year, that is telling on the resources of our great country. The Department of Agriculture and the agricultural press are the agents through which this will be accomplished.

Ellsworth, Kans.—I can see no cause of discouragement, if farmers will protect themselves by electing men of their own class to the offices within their power to elect. If a majority of our Congressmen were farmers, sent there by farmers, our interests would not suffer for proper protection.

Box Elder, Utah.—No special causes of discouragement exist here. The farmers and others have adopted a co-operative principle, and have built a good woolen factory, tannery, store, shoe-shop, dairy; and all, as well as the sheep-herd and farm, are flourishing finely. I think that when farmers can thus co-operate it is a power in their hands which has a modifying effect upon the markets, preventing in a great measure monopolies in the staple articles of life, as combinations of this character could open up business relations with manufacturers and foreign dealers direct, thus cutting off all intermediate dealers and merchants who thrive and get rich out of the farming community.

Weber, Utah.—The stock of this county is in a co-operative herd, and is kept upon a herd-ground some seventy miles away. The company declared a dividend last November of nearly 40 per cent. on the capital invested.

The word "combination" seems to have acquired a wicked significance, in view of some farmers. Let them use instead "co-operation" if they prefer it; but they must remember that there is no human being entirely independent of all others. Without association there would be neither churches nor schools, government nor social institutions. In other industries a large portion of the work done and profits made are through associated effort. There may be association for duty as well as for deviltry. There is no reason why comparative isolation should lead to positive hermitage. A great enlargement of American dairying has come from association; the monthly gathering for sales of farm animals in Madison county, Ohio, have saved immense sums from the clutches of middlemen; the inauguration of market fairs should be general; association for importing or buying animals of the best blood should be more numerous; there should be a farmer's library in every township in the land; farmers should join to build flouring mills, saw-mills, and woolen factories, if they cannot get them otherwise; and they should combine *en masse* to enforce upon politicians, railroad directories, and all others, justice and equity in their dealings with agriculture.

CHEMICAL MEMORANDA.

By Wm. McMurtrie, Chemist.

During the past month the work in the laboratory has been confined to analysis of corn, and principally to comparative experiments with different methods of proximate analysis of cereals, with a view to the determination of that which gives the best and most reliable results, and after some considerable trouble and delay, we have found one which seems not only to yield results which are entirely satisfactory, but also to be free from the complication so troublesome in the other methods in general use. In order that we may be able to experiment further with some few points in the details of working, we shall not publish our method with this month's issue, but reserve it to be published with some other analyses of corn with which we are about to proceed.

The object of these analyses is to determine the comparative value of the most important varieties of corn in the market by a comparison of the relations of the market-values to the quantity of the most important constituents which they contain. The analyses may then be applied to the different purposes for which the grain is used.

To this end we have chosen two varieties of gourd-seed corn, the white and yellow, as being fair representatives of the markets of the North and South, the former representing the southern corn, and the latter that of the North. The following are the results of a proximate analysis of yellow gourd-seed corn grown upon the farm of the Commissioner of Agriculture, in Pennsylvania:

Moisture, (determined at 130° C.)	8.87
Oil	5.17
Sugar	1.10
Gum	1.23
Zein	1.98
Starch	70.66
Albuminoids	7.94
Cellulose	1.72
Ash	1.33
	100.00

It will be seen that the percentage of moisture in this sample is quite low, and this is probably due to storing for some time in the Department building, where the temperature varies from 65° to 70° F., as well as to possible loss in the process of grinding and pulverizing.

Beet root.—The following are the results of an analysis of beet grown in Nebraska, made by Samuel Aughy, professor of natural sciences in the State Agricultural College of Nebraska, during the fall of 1872:

	Per cent
Average amount of cane sugar	13.50
Average amount of grape sugar	0.50
Average amount of potassa and soda compounds	0.43
Average amount of magnesia and lime	0.18
Average amount of nitrogenous substances	0.78

SCIENTIFIC NOTES.

Reduced or reverted phosphates.—During the past few years a great deal has been said and done with regard to the value of the different forms of phosphate of lime so extensively used in agriculture, and the

investigations that have been prosecuted in this direction cannot fail to be of interest and value both to manufacturers and consumers.

Nearly a year ago Dr. R. T. Brown, former chief chemist, advanced the idea in the annual report of this Department that the neutral or reverted form of phosphate of lime is as valuable for all practical purposes as the soluble or acid form, and on account of it was quite severely criticised by some of the agricultural chemists throughout the country. Now it is not our object in the present article to enter into an exhaustive discussion of this question, but to offer a few facts which may be of value to those interested in the subject.

It was objected that although the reduced form is soluble in organic acids and other matters present in the soil, and in this way assimilable by plants, yet in the soluble form it is capable of being more completely mixed with the soil, and in this way brought into more thorough contact with the roots of plants, and is consequently of greater value. But when we consider that the acid phosphate, when brought into contact with the carbonate of lime, iron, and alumina, with a moderate degree of moisture, is, within twenty-four to forty-eight hours, changed into the neutral or reverted form, it will at once appear that, when applied during the dry season, as it generally is, the phosphate is brought into immediate contact with these constituents in the soil by mere mixture, and before sufficient rain falls to spread it by solution, the transformation, in the majority of instances, will have taken place. The reduction can therefore be of no greater damage before application than after it. Nor can storing in warehouses have the detrimental effects that have been ascribed to it. Indeed the recent investigations of Dr. Charles U. Shepard, jr., of Charleston, South Carolina, may very aptly be cited in support of this. He has shown by certain analyses that the production of reduced phosphate by storing in warehouses is due more to the decomposition of the insoluble phosphate than to the return of the acid form, since the amount of neutral phosphate formed in samples stored one year was in excess of the loss of the acid form.

Preservatives.—A great deal has been written during the past few months concerning the preservative properties of different substances, and among those most highly recommended are acetate and silicate of soda and borax. These substances, more especially the latter, have been spoken of as admirable preservatives of milk, and they have undoubtedly a beneficial effect and cannot fail to be of practical value in this particular. We are rather inclined, however, to give preference to silicate of soda, since milk treated with a solution of water containing one twenty-fifth of the silicate, will be kept perfectly sweet for five to six days, and if the cream be then removed the remaining fluid will be found to be alkaline and without a single trace of casein. Boracic acid is much less energetic in its action and retards the separation of cream. For the former, in practice, it is recommended to dissolve about one ounce of the silicate in a quart of water, which may be added to about four gallons of milk. The fact of the addition of water may seem to many to be an objectionable feature in this treatment, but in many cases, where milk must be transported a long distance to market, the discovery may be of great practical value not only to the producer, by supplying a source of income otherwise out of his reach, but also to the consumer, by supplying a larger quantity of a good article at reduced price.

Artificial milk.—During the siege of Paris, a substitute for milk was manufactured according to the following formula: One ounce and a half of sugar is dissolved in a quart of water, and to this solution are added one ounce of dry albumen, (from white of eggs,) and 15 to 30

grains of soda crystals, and the whole made into an emulsion by the addition of one to two ounces of olive oil. As the war progressed, gelatine was substituted for albumen, and slaughter-house fats, purified by melting at 150 degrees, for the olive oil. One firm manufactured by this process 132,000 gallons of milk daily for Paris consumption.

Ceraline.—Messrs. Deveau have succeeded in extracting from wheat from which the bran has been carefully removed, *ceraline*, that highly nitrogenized portion containing phosphoric acid, which forms the compact layer just inside the bran, and is generally removed with it in the usual processes of grinding. This material contains a peculiar principle in small quantity, which stimulates digestion, and is highly recommended by the faculty of Paris as an analeptic when mixed with sugar or powdered chocolate. From this it is easy to comprehend the valuable properties of bran-meal, and if the bran be treated for this substance it may in all probability be obtained in sufficient quantity to be administered with effect in cases of dyspepsia and general indigestion.

BOTANICAL NOTES.

By Dr. George Vasey, Botanist.

Apocynum as a fiber plant.—From the Gardeners' Chronicle (London) we obtain the following item:

The Times correspondent at Berlin writes thus of a new fiber plant: A fibrous plant called *Apocynum venetum* has been discovered growing wild in such quantities, in Turkistan, that it may be expected soon to make its appearance in the market. Its fibers, as tender and delicate as flax, as strong and tenacious as hemp, are, by combining the qualities of the two, greatly superior to either. The Russians will probably endeavor to transplant it to Europe, an attempt which might be made by other countries as well.

It is tolerably well known that our species of *Apocynum*, of which we have two, furnish a superior fiber, as does also the related *Asclepias incarnata*. All these are vigorous, hardy perennials, and could, under cultivation, be made to yield large crops. A series of thorough, well-conducted experiments, which shall test the comparative value and productiveness of our native fiber plants, is much needed. But how shall it be obtained?

Poisonous plants.—Every year, and chiefly in the spring of the year, we read accounts of cases of poisoning by the eating of wild roots or plants. These cases are generally of children who meet with roots which they take to be familiar vegetables, such as the parsnip or carrot. The roots which are the cause of these accidents are usually those which belong to the natural order *Umbelliferæ*, or to the same family as the carrot and parsnip, and some of them are easily mistaken, by inexperienced persons, for those useful vegetables.

Many of the plants of the order *Umbelliferæ* are poisonous, particularly the *Cicuta maculata*, or spotted cowbane, the *Cicuta bulbifera*, and *Sium lineare*, which are distributed ever the entire United States, and a western member of the order called *Eulophus Americanus*. The poisonous principle of these plants is powerfully concentrated in the roots in early spring, just at the beginning of active vegetation. Boiling usually dispels the active and poisonous nature of such roots, but children should be cautioned against eating any wild roots or plants without the sanction of those who are acquainted with them and know their properties.

We have two species of *Rhus* which are poisonous to the touch. One of these is called poison-ivy, and may be met with in almost any woods, running over rocks or ascending trees. The other species is a shrub which grows in swamps. Some persons are much more susceptible than others to the poisonous influence of these plants. Indeed, many people can handle them with impunity, while others are poisoned by a touch, and some think that the mere neighborhood of the plant communicates the poison. The poison-ivy vine is often confounded with the Virginia creeper, or woodbine, (*Ampelopsis quinquefolia*,) which is perfectly harmless. They may be readily distinguished by observing that the leaves of the ivy are in threes, while those of the creeper or woodbine are in fives.

A few of our native plants enjoy the reputation of being poisonous, rather from their relationship to other poisonous plants than from actual poisonous properties. This is the case with some species of *Solanum* and *Physalis*, which belong to the natural order *Solanaceæ*, where also belong tobacco, henbane, nightshade, and other poisonous plants. *Solanum nigrum*, sometimes called ground-cherry, is very common in waste places and in cultivated fields, and is thought by some to be poisonous, but I have often seen its black berries eaten with relish and without harm, and even made into pies, for which they are not sufficiently tart to be agreeable.

Mr. Bailey, in an interesting article on this subject, in the American Naturalist, relates seeing a boy eating the large green potato-berries without any resulting trouble.

We have several species of *Physalis*, or ground-cherry, whose berries, when mature, are pleasant-tasted and harmless. The more general diffusion of botanical knowledge would undoubtedly be the means of avoiding much suffering and many accidents which now occur from ignorance of the nature of the plants.

HARDHACK AND POTENTILLA FRUTICOSA.—Since the publication in the December report of Mr. T. S. Gold's remarks on *Potentilla fruticosa*, several correspondents have expressed their apprehension that he may have meant the *Spirea tomentosa*, which is well known throughout the eastern States as "hardhack." This however was not the case, as Mr. Gold sent a specimen of the plant he alluded to, and it was the true *Potentilla fruticosa*, which seems also to have received the name of hardhack in that part of the country. This illustrates the great difficulty which often arises in identifying any plant by the common or local name. Botanical names, although sometimes hard to learn, have the virtue of being precise, and of always and everywhere meaning the same plant.

In confirmation of Mr. Gold's statement that the *Potentilla fruticosa* was one of the most formidable weeds of that section, we publish the following from Mr. D. F. Smith, of Goshen, Connecticut:

I have wondered whether the "hardhack" referred to by Mr. Gold was not a different shrub from that referred to by Mr. Beardslee of Ohio and others. I would say with all possible emphasis that what we in these western counties of Connecticut and Massachusetts know as "hardhack," and which Mr. Gold identifies as *Potentilla fruticosa*, is a very great nuisance, having caused damage in this town, and in other single townships, that would require thousands of dollars to represent. Hundreds of acres in this town, that twenty-five years ago were good pasture-land, have been rendered worthless by the rapid spread and dense growth of what we call "hardhack."

There need be no difficulty in discriminating between these two shrubs; the *Potentilla fruticosa* has pinnate leaves, and bright yellow flowers, while the *Spirea tomentosa* has single ovate or oblong leaves, and rose-colored or nearly white flowers. *Spirea tomentosa* is more erect and less branching, with the small flowers densely crowded into a spike which terminates the stalk.

FORESTS AND RAIN-FALL.—The "Bulletin of the Torrey Botanical Club" for February contains a letter from Mr. Fred. Hubbard, which

gives a series of facts respecting the relation of rain-fall and forests as exemplified in some of the West India Islands, which we regard as important, and from its bearing on this somewhat disputed subject we think its reproduction here will be useful.

The introductory remarks refer to some previously published statements by Mr. James S. Merriam, of New York:

Your brief published statement concerning the diminution in rain-fall of the island of Santa Cruz is in the main correct, save that it gives the idea of a more rapid change than has probably taken place. At my former visit, twenty-seven years ago, the desiccation had undoubtedly made some progress, but not sufficient to make itself manifest in a very marked degree. The change from fertility to barrenness, which at first must have been almost imperceptible, is no doubt taking place in an accelerating ratio.

Every new plantation swallowed up by the onward march of desolation, augments the cause and renders the arrest of the evil more and more hopeless. This movement is from the east (the windward end of the island) toward the west, and is now quite conspicuous. Every few years an estate, formerly green with cane-fields, becoming incapable of producing further crops, has to be abandoned to the graziers, whose cattle find a meager pasture upon it a few seasons longer. These are in turn driven off, and the land is entirely abandoned. Henceforward it becomes, if not quite a desert, at least a barren waste, producing only a sparse and prickly vegetation, over which a few arborescent cacti reign supreme. A narrow belt of green lines the sea-shore of this region, consisting of cocoa-nut palms, the poisonous manchineel, the sea-side grape, and a few shrubs, whose natural habitat is along the high-water mark; but inland cultivation is impossible without constant irrigation. As there are no streams upon the island, with the exception of a few rills chiefly near the western end, and the wells are failing, no means remain to force life from the unwilling soil. Some attempts were at one time made to arrest this insidious advance, but too late to be effectual. A planter, I was told, not long since set out a thousand trees upon his estate and lost every one. It is probable that had this remedy been universally adopted in time there might be a more hopeful future for Santa Cruz. But the final depopulation of this beautiful island seems now to be written indelibly among the decrees of fate.

St. Thomas, an island lying thirty miles distant, is similarly affected. This island, however, being loftier, and having scarcely any level land, seems to attract to itself a rather more liberal amount of moisture from the clouds.

About fifty miles westward of these islands, and in the same parallel, lies the large island of Porto Rico. The land here is almost wholly mountainous, the eastern ridges rising to 3,000 feet. A large portion of the interior is still covered with primitive forest, a tangled tropical vegetation of vivid perennial verdure. The rain-fall is abundant, and the soil yields bountiful crops of coffee and sugar, with a great variety of fruits.

The contrast between neighboring islands so similarly situated is most striking. The sad change which has befallen the smaller ones is, without any doubt, to be ascribed to human agency alone. It is recorded of these that in former times they were clothed with dense forests, and their oldest inhabitants remember when the rains were abundant, and the hills and all uncultivated places were shaded by extensive groves. The removal of the trees was certainly the cause of the present evil. The opening of the soil to the vertical sun rapidly dries up the moisture, and prevents the rain from sinking to the roots of plants. The rainy seasons in these climates are not continuous cloudy days, but successions of sudden showers, with the sun shining hot in the intervals. Without shade upon the surface the water is rapidly exhaled, and springs and streams diminish. There is also, as many believe, an electrical action produced by the points of leaves upon the atmosphere, compelling it to yield up its moisture. However feeble may be this effect from a single tree, the myriad spears of a whole forest presented to the sky undoubtedly do exert a marked and powerful influence. It is probably from such a combined action that the drying up of the soil from the removal of the trees, destroying the balance of nature, goes on with ever-increasing rapidity.

An equally marked example of the effect we are considering is seen in the small island of Curaçoa, lying in latitude 12° north, sixty miles from the coast of Venezuela. I visited this island in 1845, and found an almost perfect desert, where, according to the testimony of the inhabitants, had once been a garden of fertility. Abandoned plantations, the recent ruins of beautiful villas and terraced gardens, and broad arid wastes without a blade of grass, showed how sudden and complete a destruction had fallen upon this unfortunate little island. The cause was the cutting down the trees for the export of their valuable timber. The effect followed even more rapidly than at Santa Cruz, as the island lies five degrees farther to the south, and the heat is more intense. The rains have almost entirely ceased, and fresh water is among the luxuries. Almost within sight of Curaçoa is the coast of the Spanish Main, covered with the rankest vegetation, over which the burdened clouds shower down abundant blessings.

MICROSCOPIC OBSERVATIONS.

By Thomas Taylor.

Potato blight and rot.—Some eminent chemists, such as Dr. Lyon Playfair, believe that the potato-plant, when healthy, is not subject to attacks from fungi. In a lecture delivered by him before the Royal Agricultural Society of England, December 9, 1845, he remarked that "much had been said and written with regard to the source of the disease, and since minute fungi had been assigned as its cause, potatoes, apples, and other fruits had been inoculated with fungus spores, and had become diseased; but if there were not some previous disease in the potato itself, how was it that some varieties of potatoes escaped while growing in the immediate vicinity, while others were attacked?" The disease, he believed, arose from structural or chemical causes.

When a decayed potato was examined it was found that the diseased spots were always in the region of the spiral vessels, whose function it was to carry air into the tissue of the plants. He believed the disease originated in the oxidation of the tissue. The Rev. M. J. Berkley, the leading mycologist of England, on the other hand, contends that the fungus *Botrytis infestans*, or, as now classed under the new genus, *Peronospora infestans*, will attack the healthy tubers; but the question arises just at this point, what means have we of ascertaining the perfectly healthy structure and chemical state of tubers? Every farmer plants what he deems sound tubers, yet, in the majority of cases, since 1845, the crop during very moist seasons has been more generally affected than it was prior to that date.

The severity of attacks of fungi on plants will depend in some cases on the density of their organic structure and the solubility of their nitrogenous matter. The nitrogenous principle of potatoes, for example, is soluble in water, that of turnips nearly insoluble. The former, therefore, ferments more readily than the latter. The leaves of a healthy peach-tree, when placed in a moist atmosphere at about 75° F., resist fungoid fermentation for months, while those of a peach-tree affected with the "yellows," placed under the same general conditions, will quickly ferment and become covered with the fruit of the fungus mucor. The first possess an antiseptic property, the second are deficient in it. If two blocks of wood, one of boxwood, the other of pine, are placed in a fungoid solution, the first will resist the action of the mycelium because of its density, while the second will quickly decay. The first absorbs a great deal of water, the second very little. A certain amount of moisture, and sometimes of water, is necessary to the growth of fungi.

In years previous to the noted potato-rot of 1845, the average amount of water found in healthy potatoes, according to Professor Playfair, was 72 per cent. That of unhealthy tubers since that date, 80 per cent. The tendency to ferment is therefore increased. It was observed by Professor Playfair, in his lecture alluded to, that a peculiar state of the weather had been observed all over the north of Europe where the disease had been seen, as well as in America. The widespread use of the potato as an article of diet, especially among the laboring classes throughout Europe, must have led to the extensive planting of diseased potatoes in 1846, because healthy seed could not be found. Indeed, Professor Playfair, in his second lecture of the 10th December, 1845, recommends "the planting of diseased potatoes as seed rather than none." He further states that there was no prospect of obtaining

healthy seed from abroad, and that he had permission of the late government authorities for stating that this was the result of their consular returns. The unavoidable adoption of this advice increased the disease in after years, whether it arose from chemical, structural, or fungoid conditions.

If a healthy potato is so dug out on its opposite ends that it will resemble a double egg-cup, and placed erect on one end for about six days in an atmosphere at the temperature of 70° F., its under cavity will become covered with mildew and its fruit will appear in the form of blue mold, *Penicillium glaucum*. In this case the inverted cavity will retain the moisture, and as a consequence slight fermentation will ensue, the fungus deriving its nutriment from the potato; but the upper surface, although fully exposed to the floating germs in the atmosphere, will not sustain a fungus growth, in consequence of the free evaporation of the moisture from it. This form of fermentation should not be confounded with that produced by the fungus of potato-rot, *Peronospora infestans*. The chemical action of the blue-mold fungus is slow, and its odor is simply that of sour paste, while the destructive action of the potato-rot is very rapid, producing a higher state of decomposition and very offensive odors. The mycelium and fruit of each fungus also differ essentially from each other. Both forms of fungus produce oxidation, but with very different results. Consequently potato-rot consists of more than the mere "decay of the tissue by its absorption of oxygen." The purely fungoid theory, on the other hand, will not account for the many exceptions pointed out by those who favor the chemical theory; since it may be shown that as the chemical constitution and density of any vegetable vary, so will the genus and species of fungi be found to vary with the proximate principles of plants.

The following case of rust on the Kittatinny blackberry illustrates forcibly the fact that the structural and chemical condition of a living plant should always be considered in relation to fungus growth on them.

Chalkley Gillingham, of Accotink, Fairfax County, Virginia, under date of Secondmonth 28, 1873, describing the condition of his blackberry canes during the spring of 1872, says that six years ago he planted ten rows of Kittatinny and ten of Wilson in the following manner: First, four rows of Kittatinny, then following, alternately, Wilson and Kittatinny, six rows of each, ending with four rows of Wilson. All had been treated alike from the time they had been received by him, and all appeared healthy until last spring, when the Kittatinny became covered with "rust." At a short distance the rows of Kittatinny appeared as if painted with yellow ocher. Some were destroyed from its effects. None of the Kittatinny canes bore fruit. The Wilson were uninjured, although surrounded by an atmosphere laden with fungus spores. Every leaf of the Kittatinny was covered with hundreds of millions of spores, yet not a leaf of the Wilson was affected. The Wilson canes bore the usual complement of fruit. Mr. Gillingham states that the canes have not been manured for several years.

The glossy covering of fruits and leaves consists of wax, that of the grasses of siliceous matter. The wax may be removed by sulphuric ether, the siliceous matter by caustic alkalies or hydrofluoric acid. Should plants fail to eliminate and cover their surfaces with wax or silica for their protection, their albuminous substances will then afford food for the growth of fungi. Future investigations may prove that in the case of the Kittatinny blackberry alluded to, the absence of this outer protection was the cause of their destruction. The accompanying illustration

is very similar to that given in my former report on potato-disease, (see Report for November and December, 1872, page 510,) in which it is shown that two varieties of potatoes, viz, Jackson Whites and Early Rose, growing in the same field, and treated alike in all respects, were affected differently. The Early Rose potatoes were wholly destroyed by fungi, while the Jackson White, although surrounded by the spores of the potato-rot fungus, were not affected.

Having received a supply of seemingly healthy potatoes from New Mexico, Ohio, and other places, and a few diseased tubers from Boston and Swampscott, Massachusetts, I commenced a series of preliminary experiments to test the chemical and structural theories of Dr. Lyon Playfair, and the fungoid theories of M. J. Berkeley and other leading mycologists.

In four glass jars I placed a pint of water. In No. 1 were placed a portion of fungus *Peronospora infestans*, and the half of an Ohio potato remarkable for its healthy appearance. In No. 2 were placed a diseased potato containing *Peronospora infestans*, and the half of a potato received from Sante Fé, New Mexico. In No. 3 was placed the second half of the Ohio potato alluded to, and in No. 4 the second half of the Santa Fé specimen. In Nos. 3 and 4 was also put half an ounce of pure sugar, to assist fermentation. These specimens were subject, during the experiments, to a temperature of about 75° F. The respective jars were examined from day to day. On the sixth day the Ohio specimen in No. 1 was found to be rotting rapidly, while the Santa Fé specimen in No. 2 was apparently uninjured. Specimens Nos. 3 and 4 were undergoing slow fermentation. At first the water containing the New Mexican specimen became more milky in color than did that of the Ohio specimen, but the deterioration on the third day was greater in No. 3 than it was in No. 4.

On the twentieth day the Ohio specimen was perfectly dissolved, forming a pulp, while the Sante Fé specimen retained its perfect consistency throughout. On examining the pulp of No. 4 under the microscope I found that the starch-granules were arranged in cellulose cells, no liberated granules appearing on the field of view. Bundles of mycelium and budding spores appeared in profusion between the cells. Few infusorials appeared in view. The odor was slightly sour. The appearance of No. 4, as seen under the microscope, of about 80 diameters, was remarkable as contrasted with No. 3. The latter specimens presented a mass of infusorial life, mycelium, and budding spores. I made many examinations of the pulp to detect starch-cells if present, but found none. The fermentation had completely destroyed them. The odor was very bad.

The Ohio specimen in No. 1 rotted much quicker under the influence of *Peronospora infestans* than it did under the *Torula* fungus favored by the action of sugar in No. 4 solution.

The Sante Fé specimen in No. 2 resisted the *Peronospora infestans* fungus better than it did the *Torula* fungus in No. 4; but, by the use of either fungus, the tendency of any variety of the potato to resist fungus action may, by this mode, be easily decided. Since the preceding experiments were made, other northern and eastern varieties have been tested by fungoid solutions in contrast with some of the New Mexican varieties, giving like results, clearly demonstrating the superiority of the Sante Fé potatoes over all others thus far examined in respect to their powers of resisting fungoid and infusorial action.

It is not unusual to find a decayed spot in the center of potatoes otherwise apparently in good condition. A microscopic examination of

a portion of the diseased part will show that the decay commenced where the vascular bundles concentrate. See 2, Fig. 1. At that point the air is in greater volume than elsewhere.

When such spots are exposed to the atmosphere the fungus, blue mold, forms on the surface. This disease, therefore, has no relation to potato-rot, as ordinarily understood. F represents the mycelium (spawn) of blue mold, *Pennicillium glaucum*, and G that of potato-rot, *Peronospora infestans*.

The vascular bundles are much smaller in some varieties of pototoes than in others, and the texture of the cellular matter varies also. I think it probable that those varieties having the smallest air-passages, all other considerations being equal, will be the least affected by the fungus *Peronospora infestans*.

The air passages of the vascular bundles may be easily seen by the

naked eye. Cut a potato in two through its root stem; trim the surface so that some of its eyes will be in section; coat the surface with a solution of bichromate of potash; dry the surface with filtering-paper, then coat it all over several times with a strong alcoholic solution of iodine; the starch will become stained of a dark blue, while the vascular bundles will remain yellow. An examination will show that the air-ducts extend in every case to the eyes.

The stalks being simply an extension of them, 2 and 3 3 represent the combination of the spiral and dotted ducts; A, the root stem; B, a new growth or tuber from 1. Viewing their connection in this way, it will be seen that any germinal disease entering through the root-stem A will necessarily communicate through all the connecting links, viz: A, 2, 3 3, B. In my former paper on this subject, published in the monthly report alluded to, Fig. 22, page 508, represents a sectional drawing of the air-cells, showing their general character; S S represents the fruit of a slender light-colored myceleum, which I have found traversing the exterior and interior of the withered potato-stalks. In the more advanced stages the fruit has appendages in length about one and a half times the diameter of their seed-bags, S S. They have a thorn-like appearance, slightly wavy, and of amber color. To the naked eye they appear like fly-spots, and are very numerous. The conceptacles appear black, but when treated by nitric acid the dark color is removed and a cellular under surface of an amber color is exhibited. Thus far I have not been able to detect any sporangia in them. This may be accounted for from the fact that all the specimens I have examined had been dried up for a long period. 4 represents the fruit of *Peronospora infestans* on the leaves very highly magnified. The arrows represent the movements of the fungus matter; C, starch-cells, liberated by the fungoid solution and full of starch granules; D, the starch-cells of watery potatoes. They contain very little starch. E, the starch-cells as arranged in the potato. Some are void of starch, while some are well filled; others partially so. H represents the condition of starch in water when a fresh potato is grated down, or when the cellulose-cells are rotted away by fungus, as in the case stated.

The following mode of separating the vascular bundles from the potatoes, so that they may be viewed separately, will prove of interest to the vegetable physiologist:

Take a potato of medium size, remove the skin carefully without cutting the eyes; place it in a solution of sugar and water, (in the proportion of about two ounces of sugar to a pint of water,) and subject it to 75° F. for about twelve days. The fungus of fermentation will reduce the potato to a pulp, but the vascular bundles will be found apart and may be removed with a glass rod, and mounted in the usual way with gum or balsam. Under a power of about 100 diameters, they present a most singular, yet beautiful appearance. The pointed forms which extend to the eyes may be distinctly seen. This experiment is most successfully performed with the eastern and western potatoes. The starch-cells of the Santa Fé potatoes, for example, remain in a compact form, even when the nitrogenous matter has been destroyed by fungus or infusorials. The "air bundles," therefore, cannot be removed from them easily, which I consider another proof of their matured condition.

The following chemical direct mode of making observations of the position and structure of the air passages I sometimes employ: First, remove from a healthy potato a thin slice or disk. Pour over it concentrated nitric, muriatic, or dilute sulphuric acid, (caustic potash or soda will have the same effect,) when the starch will become transparent.

All of these alkalies and acids have the effect of dissolving the starch, but they have no effect on the air-passages, or vascular bundles; they are, therefore, rendered visible, when mounted in the usual manner and viewed by a sufficiently high power.

The Department has procured samples of every variety of potatoes from Santa Fé, New Mexico, to test practically, in the open field, their anti-fungoid qualities, in contrast with the usual varieties grown in that country.

In a letter addressed to this Department by Governor Arny, Santa Fé, New Mexico, February 17, 1873, he says: "We have not had any 'rot' in the potatoes of New Mexico. * * * I send two packages of alkali soil; this is a soil on which potatoes will not grow—abundance of tops but no 'tubers.'"

An excessively alkaline soil seems to have the same effect as very high manuring, viz, to produce stalks but no tubers.

MARKET PRICES OF FARM PRODUCTS.

FEBRUARY AND MARCH, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.

Articles.	February.	March.
NEW YORK.		
Flour, superfine State ....per barrel..	$6 40 to $7 15	$5 90 to $6 65
extra State....do....	7 35 to 8 65	7 10 to 8 40
superfine western....do....	6 40 to 7 15	5 85 to 6 65
extra to choice western....do....	7 30 to 13 00	6 75 to 12 75
southern ship'g, com. to choice..do....	6 50 to 9 00	6 10 to 8 15
southern family, ord'y to choice..do....	9 00 to 13 25	8 15 to 12 75
Wheat, No. 1 spring....per bushel..	1 75 to 1 78	1 69 to 1 75
No. 2 spring....do....	1 62 to 1 72½	1 55 to 1 56
winter, red, western....do....	1 90 to 2 00	1 80 to 1 95
winter, amber, western....do....	2 00 to 2 05	1 85 to 2 00
winter, white, western ....do....	2 00 to 2 35	1 80 to 2 15
Rye ....do....	85 to 92	90 to 95
Barley....do....	90 to 1 30	1 00 to 1 24
Corn....do....	63½ to 67	61 to 65½
Oats....do....	53 to 57½	48½ to 51⅓
Hay, retail qualities ....per ton...	26 00 to 34 00	26 00 to 34 00
North River....do....	23 00 to 24 00	22 00 to ———
Pork, mess....per barrel..	14 25 to ———	15 37½ to 15 50
extra prime....do....	11 37½ to ———	——— to 12 00
prime mess....do....	13 87½ to 14 00	14 25 to 14 50
Lard ....per pound..	08 to 08¾	08¼ to 08¾
Beef, plain mess....per barrel..	4 00 to 11 75	9 00 to 11 75
extra....do....	8 50 to 13 50	12 00 to 13 50
Butter, western....per pound..	15 to 30	18 to 31
State dairy....do....	32 to 45	32 to 48
Cheese, western factory....do....	13½ to 14½	12 to 15
State factory....do....	13½ to 16¼	13½ to 17
Cotton, ordinary to good ordinary....do....	18¼ to 20½	17¼ to 18½
low middling to good middli'g..do....	20¼ to 23¾	19 to 23½
Tobacco, lugs, all grades....do....	09¾ to 10½	——— to 08½
com. to med. leaf, all grades..do....	10½ to 11¼	9 to 10¾
Wool, American Saxony fleece....do....	65 to 75	63 to 73

Market prices of farm products—Continued.

Articles.		February.	March.
NEW YORK—Continued.			
Wool, American merino, full blood	do	$0 65 to $0 75	$0 63 to $0 73
American, combing	do	65 to 75	63 to 73
pulled	do	44 to 65	42 to 61
California, spring clip, unwash'd	do	30 to 45	33 to 40
California, fall clip, unwashed	do	25 to 30	20 to 28
Texas	do	28 to 42	22 to 40
BOSTON.			
Flour, western, superfine	per barrel	5 75 to 6 25	5 50 to 6 25
western extras	do	7 00 to 10 00	6 75 to 9 00
western choice	do	10 00 to 12 75	9 50 to 13 00
southern extras	do	7 00 to 7 50	7 00 to 7 50
choice Baltimore	do	10 00 to 12 00	10 00 to 12 00
Wheat	per bushel	1 65 to 2 00	1 65 to 2 00
Rye	do	1 00 to 1 05	1 00 to 1 05
Barley	do	90 to 1 20	90 to 1 20
Oats	do	54 to 60	53 to 60
Corn, southern yellow	do	73 to 75	77 to 78
western yellow	do	73 to 75	77 to 78
Hay, eastern and northern	per ton	20 00 to 28 00	18 00 to 28 00
Beef, western mess	per barrel	12 00 to 12 50	12 00 to 12 50
western extra	do	13 00 to 14 00	13 00 to 14 00
Pork, prime	do	11 50 to 12 00	12 00 to 12 50
mess	do	14 50 to 15 00	15 00 to 15 50
Lard	per pound	08½ to 09¼	08½ to 09¼
Butter, New York and Vermont	do	18 to 37	18 to 38
western	do	15 to 30	15 to 32
Cheese, N. Y. and Vt., factory	do	13 to 16½	13 to 17
New York and Vermont dairy	do	12 to 15½	12 to 16½
Ohio factory, good to choice	do	13 to 16	13 to 16½
Cotton, ordinary to good ordinary	do	18¼ to 20¼	17 to 19
low middling to good middling	do	20¼ to 25	19½ to 24
Tobacco, lugs	do	10 to 10½	10 to 10½
common to medium leaf	do	11 to 12	11 to 12
Wool, Ohio and Pennsylvania	do	62 to 70	56 to 64
Michigan	do	60 to 66	55 to 60
other western	do	59 to 64	55 to 59
pulled	do	35 to 70	25 to 70
combing-fleece	do	70 to 75	65 to 70
California	do	23 to 50	20 to 27
Texas	do	45 to 55	25 to 35
PHILADELPHIA.			
Flour, superfine	per barrel	4 50 to 5 25	5 00 to ———
Pennsylvania extra	do	6 25 to 7 00	6 25 to 6 75
Pennsylvania, family	do	8 50 to 9 25	8 50 to 8 75
western family	do	7 87½ to 9 00	7 50 to 9 50
western fancy	do	9 00 to 11 50	10 00 to 11 50
Wheat, winter, red, western	per bushel	1 90 to 1 97	1 88 to 1 97
winter, amber, western	do	2 00 to 2 05	1 97 to 1 98
winter, white, western	do	2 05 to 2 15	2 05 to 2 10
spring	do	1 60 to 1 75	1 70 to 1 78
Rye	do	87 to ———	85 to 88
Barley	do	90 to 1 05	82 to 1 25
Oats, western, mixed	do	46 to 47	46 to 47
western, white	do	49 to 52	47 to 50
Corn, yellow	do	58 to 60	58 to 60
white	do	67 to 68	62 to 63
Hay, fresh, bale	per ton	30 00 to 36 00	27 00 to 30 00
common to fair shipping	do	30 00 to 32 00	27 00 to 30 00

Market prices of farm products—Continued.

Articles.		February.			March.		
PHILADELPHIA—Continued.							
Pork, mess	per barrel	$13 50	to	$14 00	$13 75	to	$15 25
prime mess	do	12 00	to	12 50	13 00	to	13 25
Beef, western mess	do	8 00	to	10 00	8 00	to	10 00
extra mess	do	10 00	to	12 00	10 00	to	12 00
Warthman's city family	do	16 00	to	——	16 00	to	——
Lard	per pound	7¾	to	11¼	8	to	11¼
Butter, choice	do	32	to	40	28	to	40
good	do	26	to	30	25	to	28
Cheese, New York factory	do	15	to	16½	15	to	16
Ohio factory	do	15	to	15¼	15	to	16
Cotton, ordinary to good ordinary	do	18½	to	20½	18½	to	19
low middling to good middling	do	20½	to	23	19½	to	22½
Wool, Ohio X and XX	do	66	to	70	62	to	63
Ohio combing	do	78½	to	80	76	to	80
Virginia fine and X	do	65	to	——	59	to	——
Indiana tub-washed	do	65	to	75	62	to	68
unwashed	do	30	to	49	23	to	45
pulled	do	53	to	57	50	to	56
BALTIMORE.							
Flour, superfine	per barrel	5 50	to	9 00	5 37	to	8 50
extra	do	6 75	to	10 50	6 75	to	10 00
family and fancy	do	8 50	to	12 50	8 25	to	12 00
Wheat, white, fair to choice	per bushel	2 00	to	2 35	1 90	to	2 25
amber, choice	do	2 25	to	2 35	2 20	to	2 25
red, common to prime	do	1 80	to	2 20	1 80	to	2 15
red, western	do	1 78	to	2 02	1 70	to	1 90
Rye, common to prime	do	95	to	1 01	75	to	85
Corn, white, southern	do	65	to	66	65	to	—
yellow, southern	do	60	to	61	58	to	59
mixed, western	do	61½	to	—	58	to	58½
Oats, southern	do	46	to	48	46	to	48
western	do	43	to	46	46	to	49
Hay, western, good	per ton	28 00	to	33 00	26 00	to	30 00
Pork, mess	per barrel	13 75	to	14 00	15 75	to	16 00
Beef, Baltimore mess	do	15 00	to	20 00	15 00	to	20 00
extra	do	23 90	to	25 00	23 00	to	25 00
Lard	per pound	08	to	0 8¼	08¼	to	08⅝
Butter, New York	do	30	to	40	38	to	42
choice, western	do	30	to	35	30	to	35
good to prime western	do	22	to	27	25	to	32
Cheese, eastern	do	16	to	17	17	to	18
western	do	15½	to	16	16½	to	17
Cotton, ordinary to good ordinary	do	17⅝	to	19¼	17½	to	18¼
low middling to good middling	do	19½	to	21½	19½	to	20½
Tobacco, lugs,	per cental	7 50	to	9 00	7 50	to	10 00
common to medium leaf	do	8 50	to	11 00	8 50	to	11 00
Wool, fleece, washed, com. to fine	per pound	45	to	50	45	to	50
tub-washed	do	55	to	60	55	to	60
unwashed	do	35	to	38	35	to	38
pulled	do	35	to	40	35	to	40
CINCINNATI.							
Flour, superfine	per barrel	6 00	to	6 75	5 50	to	6 25
extra	do	7 75	to	8 15	7 40	to	7 75
family and fancy	do	8 00	to	9 50	7 75	to	8 00
Wheat, red winter, No. 1	per bushel	1 77	to	1 78	1 73	to	——
red winter, No. 2	do	1 72	to	1 73	1 68	to	1 70
white	do	1 90	to	1 92	1 90	to	1 95

Market prices of farm products—Continued.

Articles.	February.	March.
CINCINNATI—Continued.		
Rye ..... do	$0 84 to $0 89	$0 80 to $0 82
Barley ..... do	70 to 72	77 to 85
Corn ..... do	41 to 42	37 to 43
Oats ..... do	32 to 40	34 to 38
Hay, baled, No. 1 ..... per ton	20 00 to 21 00	18 00 to 20 00
lower grades ..... do	16 00 to 18 00	15 00 to 17 00
Beef, plate ..... per barrel	13 00 to ———	14 00 to 14 50
Pork, mess ..... do	12 75 to 13 00	14 50 to 15 00
Lard ..... per pound	7⅜ to 8	8⅛ to 8¼
Butter, choice ..... do	22 to 25	28 to 33
good to prime ..... do	20 to 22	23 to 27
Cheese, factory ..... do	14½ to 15½	15½ to 16
pine-apple ..... do	——— to 25	22 to 23
Cotton, ordinary to good ordinary .... do	16½ to 17⅞	15 to 17⅛
low middling to good middl'g. do	19 to 21	18⅝ to 21
Tobacco, lugs ..... do	8½ to 22	——— to ———
leaf ..... do	10 to 30	——— to ———
Wool, common to medium washed ... do	50 to 53	48 to 50
medium to fine ..... do	53 to 55	50 to 52
tub-washed ..... do	60 to ———	55 to 60
unwashed, clothing ..... do	33 to 35	33 to 35
unwashed, combing ..... do	45 to 48	40 to 45
pulled ..... do	45 to 47	40 to 43
CHICAGO.		
Flour, white win'r, ex., f'r to choice, per barrel	7 50 to 10 25	7 90 to 10 50
red winter, extra ..... do	6 50 to 7 75	7 00 to 8 00
good to choice spring, extra .... do	6 00 to 7 25	6 12½ to 7 00
spring, superfine ..... do	3 25 to 5 25	3 50 to 5 80
good to fancy Minnesota ..... do	6 75 to 8 00	7 00 to 8 00
Wheat, No. 1 spring ..... per bushel	1 31 to ———	——— to ———
No. 2 spring ..... do	1 25⅝ to 1 26½	1 18 to 1 19⅛
No. 3 spring ..... do	1 12 to ———	1 05½ to 1 06½
Rye, No. 2 ..... do	68 to ———	64½ to 66
Barley, No. 2 ..... do	75 to 78	70 to 72
Corn, No. 2 ..... do	30½ to 30⅝	31 to 31½
Oats, No. 2 ..... do	25½ to 25⅝	25¾ to 26¼
Hay, timothy ..... per ton	15 00 to 17 00	14 00 to 17 00
prairie ..... do	9 50 to 11 00	9 00 to 10 50
Pork, mess ..... per barrel	12 00 to ———	13 30 to 13 35
Beef, mess ..... do	9 50 to 10 00	9 50 to 10 00
Lard ..... per cental	7 27½ to 7 32½	7 57½ to 7 60
Butter, strictly choice dairy ..... per pound	23 to 28	27 to 32
good to choice roll ..... do	17 to 21	18 to 28
Cheese, New York factory ..... do	14 to 15½	16 to 17
Ohio factory ..... do	13 to 14	13½ to 15½
western factory ..... do	12 to 14	13½ to 15½
Wool, tub-washed ..... do	55 to 65	48 to 63
fleece-washed ..... do	45 to 58	43 to 55
unwashed ..... do	33 to 40	31 to 35
pulled ..... do	48 to 50	44 to 48
SAINT LOUIS.		
Flour, winter, superfine ..... per barrel	5 50 to 6 10	
winter, extras ..... do	6 25 to 7 35	
winter, choice and family ..... do	7 60 to 10 50	
Wheat, red winter, No. 1 ..... per bushel	——— to ———	
red winter, No. 2 ..... do	2 02 to 2 05	
spring, No. 2 ..... do	1 35 to 1 45	
Rye, No. 2 ..... do	74 to 78	
Barley ..... do	50 to 1 10	
Corn ..... do	31 to 39	
Oats ..... do	29 to 38	

Market prices of farm products—Continued.

Articles.	February.	March.
ST. LOUIS—Continued.		
Hay, shipping and choice timothy, per ton	$24 00 to $26 00	
prime, do	20 00 to ———	
Pork, mess, per barrel	12 75 to 13 00	
Beef, mess, do	14 00 to ———	
Lard, per pound	7 to 9	
Butter, roll, prime to strictly choice, do	18 to 25	
choice packed, do	25 to 30	
Cheese, factory, do	15 to 16½	
Cotton, middling, do	18½ to 19½	
Wool, tub-washed, do	57 to 60	
fleece, washed, do	45 to 55	
unwashed, clothing, do	33 to 38	
unwashed, combing, do	42 to ———	
NEW ORLEANS.		
Flour, superfine, per barrel	6 85 to 7 25	$6 62½ to $———
extras, do	7 50 to 9 00	6 90 to 8 50
choice, do	9 25 to 11 25	9 00 to 11 25
Corn, white, per bushel	75 to 78	65 to 68
yellow, do	75 to ———	68 to 70
Oats, do	55 to ———	50 to 52
Hay, choice, per ton	55 00 to ———	29 00 to 30 00
prime, do	——— to ———	25 00 to 26 00
Pork, mess, per barrel	14 50 to 15 50	14 50 to 15 25
extra prime, do	13 50 to ———	——— to ———
Beef, Texas, do	11 50 to 12 00	11 50 to 12 50
western, do	16 00 to 17 00	15 00 to 16 50
Lard, per pound	8 to 9¾	8 to 9½
Butter, choice western, do	25 to 27	25 to 28
choice Goshen, do	40 to 42	42 to ———
Cheese, choice factory, do	15 to ———	16 to 17
New York cream, do	18 to ———	19 to ———
Cotton, ordinary to good ordinary, do	16½ to 18½	15⅝ to 18
low middling to good middling, do	18⅞ to 21	18⅜ to 20½
Tobacco, lugs, do	8 to 9½	8 to 9
low-leaf, do	9 to 10	9 to 10
medium-leaf, do	10 to 11½	10 to 11
Wool, lake, do	45 to ———	40 to 42
Louisiana, clean, do	35 to ———	30 to 35
SAN FRANCISCO.		
Flour, superfine, per barrel	4 50 to 4 75	——— to 5 00
extra, do	5 00 to 5 25	5 25 to 5 50
higher grades, do	5 50 to 6 00	——— to 5 75
Wheat, State, per cental	1 75 to 2 00	1 50 to 1 90
Oregon, do	1 80 to 2 00	1 75 to 1 85
Barley, do	1 15 to 1 45	1 38 to 1 40
Oats, do	2 00 to 2 15	2 00 to 2 25
Corn, white, do	1 25 to 1 30	1 25 to ———
yellow, do	1 15 to 1 20	1 25 to ———
Hay, State, per ton	22 50 to ———	15 00 to 22 50
Pork, mess, per barrel	18 00 to 20 00	18 00 to 19 00
prime mess, do	17 50 to 18 00	17 50 to 18 00
Beef, mess, do	10 00 to 11 50	10 00 to 12 00
family mess, half barrel	9 00 to 10 00	9 00 to 10 00
Lard, per pound	9 to 11	9½ to 11
Butter, overland, do	15 to 35	15 to 30
California, do	40 to 50	30 to 32½
Oregon, do	18 to 20	18 to 20
Cheese, do	12 to 16	12 to 16
Wool, native, do	12 to 30	12 to 20
California, do	25 to 28	25 to 28
Oregon, do	25 to 28	25 to 28

LIVE-STOCK MARKETS.

	February.			March.		
NEW YORK.						
Cattle, extra beeves.....per cental..	$13 50	to	$14 00	$13 50	to	$14 50
good to prime.....do.....	12 00	to	12 50	12 00	to	13 00
common to fair.....do.....	10 00	to	11 25	11 00	to	11 75
poorest grade .....do.....	8 00	to	9 50	8 50	to	10 00
average.....do.....	11 25			11 50		
BOSTON.						
Cattle, choice, live weight.....per cental..	7 75	to	8 00	7 75	to	8 00
extra, live weight .....do.....	7 25	to	7 50	7 00	to	7 50
first quality, live weight.....do.....	6 00	to	7 00	6 25	to	6 50
second quality, live weight....do.....	4 75	to	5 50	4 25	to	5 25
third quality, live weight ....do.....	3 50	to	4 00	3 50	to	4 00
working oxen.....per pair..	100 00	to	250 00	100 00	to	250 00
milch cows with calves.....per head..	40 00	to	60 00	35 00	to	60 00
milch cows, extra.....do.....	65 00	to	85 00	65 00	to	85 00
farrow cows.....do.....	20 00	to	35 00	———	to	———
Hogs, western, fat.....per cental..	5 25	to	———	5 50	to	5 75
Sheep, spring lambs .....do.....	6 75	to	8 00	6 50	to	8 50
PHILADELPHIA.						
Cattle, extra beeves.....per cental..	8 00	to	8 25	———	to	———
choice .....do.....	7 00	to	7 75	7 50	to	7 87
common to good.....do.....	4 50	to	6 50	5 00	to	7 50
Sheep, common to choice .....do.....	4 50	to	8 00	2 00	to	8 00
Hogs, corn-fed, net .....do.....	6 50	to	———	7 75	to	———
BALTIMORE.						
Cattle, best beeves.....per cental..	6 25	to	7 50	6 00	to	7 50
first quality.....do.....	5 00	to	6 25	5 50	to	6 50
medium, or good fair quality..do.....	4 00	to	5 00	4 75	to	5 50
ordinary, thin steers, oxen, or cows .....per cental..	2 75	to	4 00	3 00	to	4 75
general average .....do.....	5 25			5 50		
extreme range.....do.....	2 75	to	7 50	3 00	to	7 50
sales mostly from .....do.....	4 62½	to	5 75	5 25	to	6 25
Sheep.....do.....	4 75	to	8 00	5 00	to	7 50
Hogs ....net.....do.....	6 25	to	6 75	7 25	to	7 87½
CINCINNATI.						
Cattle, shipping grades.....per cental..	5 00	to	5 50	5 00	to	5 50
prime to extra butcher's grades do.....	4 25	to	5 00	4 25	to	5 25
medium.....do.....	3 25	to	4 00	3 25	to	4 00
inferior .....do.....	2 50	to	3 00	2 75	to	3 00
Sheep, prime to extra.....do.....	4 50	to	5 50	4 50	to	5 75
common to good.....do.....	3 00	to	4 00	3 00	to	4 00
Hogs, butcher's grades .....do.....				5 25	to	5 35
shipping grades.....do.....				4 85	to	5 10
good to prime .....do.....				4 50	to	4 60
CHICAGO.						
Cattle, extra graded steers, average 1,400 pounds.....per cental..	6 15	to	6 35	6 10	to	6 35
choice beeves, fat, well-formed, 3 to 5 years old, 1,300 to 1,400 pounds... .....per cental..	5 75	to	6 00	5 60	to	5 90

Live stock market—Continued.

Articles.	February.	March.
Cattle, good beeves, well fattened, 1,200 to 1,300 pounds.....per cental..	$5 25 to $5 65	$5 25 to $5 40
medium grades, steers in fair flesh, 1,100 to 1,250 pounds...per cental..	4 50 to 5 00	4 75 to 5 00
butcher's stock, common to medium steers and good to extra cows, 800 to 1,100 pounds.....per cental..	3 50 to 4 25	3 50 to 4 50
common cattle, decently fleshed, 700 to 1,050 pounds.....per cental..	3 00 to 4 00	3 25 to 4 25
inferior	1 75 to 2 50	1 75 to 2 75
Texans, north summered..per cental..	2 50 to 3 50	2 50 to 3 50
Texans, corn fed.....do.....	3 75 to 4 50	3 75 to 4 50
Sheep, common to medium.....do.....	3 50 to 4 50	3 75 to 4 50
good to choice.....do.....	4 75 to 5 75	4 75 to 5 50
Hogs, medium.....do.....	.....	4 65 to 4 80
good to strictly choice.....do.....	3 85 to 4 25	4 85 to 5 00
SAINT LOUIS.		
Cattle, choice native-blooded steers, 1,300 to 1,600 pounds.....per cental..	5 50 to 6 00	
prime native-blooded, 2d class, 1,150 to 1,400 pounds.....	4 50 to 5 60	
good 3d grade native, 1,050 to 1,300 pounds.....per cental..	4 00 to 4 50	
fair butcher steers, 1,000 to 1,200 pounds.....per cental..	3 50 to 4 00	
thrifty stock steers, 900 to 1,300 pounds.....per cental..	3 50 to 4 00	
light, uneven stock steers, 500 to 850 pounds.....per cental..	2 50 to 3 00	
choice corn-fed fat Texans.....do.....	4 00 to 4 50	
calves per head.....do.....	6 00 to 10 00	
cows with calves.....do.....	25 00 to 50 00	
NEW ORLEANS.		
Cattle, Texans, corn-fed, 1st quality..per cental..	8 00 to 11 00	8 00 to 11 00
Texans, corn-fed, 2d quality..per head..	40 00 to 50 00	40 00 to 50 00
Western beeves, net.....per cental..	10 00 to 12 50	10 00 to 12 50
milch cows, choice.....per head..	80 00 to100 00	80 00 to100 00
lower grades.....do.....	50 00 to 80 00	50 00 to 80 00
calves .....do.....	8 00 to 12 00	8 00 to 12 00
yearlings.....do.....	10 00 to 14 00	10 00 to 14 00
Hogs .....per cental..	5 50 to 6 50	5 50 to 6 50
Sheep, 1st quality.....do.....	5 00 to 7 00	5 00 to 7 00
2d quality.....do.....	3 00 to 4 05	3 00 to 4 05
3d quality.....do.....	2 00 to 2 10	2 00 to 2 10

FOREIGN MARKETS.

WHEAT.—The London weekly average prices of wheat during January and February ranged from 58*s*. 5*d*. to 58*s*. 2*d*. per quarter. The standing quotations of the Mark Lane Express for the London market, during the two months, were as follows: British white wheat, 50*s*. to 67*s*. per quarter; British red wheat, 50*s*. to 63*s*.; American, 57*s*. to 61*s*.;

California, 66*s.*; Chilian white, 67*s.*; German, 59*s.* to 72*s.*; Australian, 64*s.* to 67*s.*; Russian, 47*s.* to 60*s.*

In Liverpool during the two months American white wheat ranged from 13*s.* to 14*s.* per cental; red winter and southern, 12*s.* to 12*s.* 6*d.*; No. 1 spring, 12*s.* to 12*s.* 6*d.*; No. 2 spring, 11*s.* 3*d.* to 12*s.*; Canadian white, 12*s.* 6*d.* to 14*s.*; Canadian red, 12*s.* to 12*s.* 6*d.*; Californian white, 11*s.* 11*d.* to 13*s.* 9*d.*; Chilian white, 12*s.* to 12*s.* 7*d.*; French white, 12*s.* 6*d.* to 12*s.* 9*d.*; French red, 11*s.* 7*d.* to 12*s.* 1*d.*; Spanish white, 12*s.* 6*d.* to 12*s.* 8*d.*; Danubian, 7*s.* to 9*s.* 10*d.*; Egyptian, 8*s.* 10*d.* to 11*s.* In Paris the wheat trade has shown no remarkable fluctuations. The extreme range from inferior to the best white being from 49*s.* to 58*s.* 6*d.* per quarter.

At the close of 1872 the whole stock of wheat and flour on hand in the British islands was equal to 1,676,983 quarters of wheat, or about one month's supply, showing a reduction of 403,626 quarters as compared with 1871. The stocks on hand reported in Russia, Germany, and America, being below those of the previous year, it was hoped that France and other southern countries would supply the deficit. Wheat seeding was delayed by unfavorable weather, and it was thought would be largely postponed till February. The general conditions of January and February stimulated vegetation. The temperature was unusually high, while rain was so abundant that many clay lands were entirely saturated, giving rise to the fear that the wheat already sown would rot in the ground. Newly thrashed samples were quite indifferent, while the lessening supply of British wheat seemed to leave the market measurably clear for foreign imports. Among the earlier arrivals from abroad were noted some splendid samples of California white wheat, weighing 66 pounds to the bushel, and held at only 65*s.* per quarter in London. Unusually high prices at Marseilles and other Mediterranean ports gave some uneasiness in regard to the diversion of the Mediterranean wheat trade from England. As the winter months passed the fears as to rotting wheat already sown were, to some extent, realized, but the anticipated deficit bids fair to be amply supplied by foreign imports. The British deficiency, up to harvest, was estimated at 5,334,000 quarters, of which at least 1,100,000 quarters were expected from California, and nearly as much from Australia. The crops of Belgium and Germany were reported as promising.

Flour.—In London the rates of British flour continued uniform during the first two months of 1872; best town households, 50*s.* to 57*s.* per sack of 280 pounds; best county households, 44*s.* to 47*s.*; Norfolk and Suffolk, 38*s.* to 43*s.*; American flour, per barrel, 26*s.* to 29*s.*; extra, 31*s.* to 34*s.* In Liverpool the standing quotations for English and Irish superfines were 40*s.* to 42*s.* per sack of 280 pounds; English and Irish extra, 43*s.* to 51*s.*; French, 48*s.* to 53*s.* 6*d.*; Spanish, 47*s.* to 47*s.* 6*d.*; Trieste and Hungarian, 64*s.* to 74*s.*; Chilian and California, 44*s.* 6*d.* to 50*s.*; American, western State, 28*s.* 6*d.* to 31*s.*; extra State, 30*s.* to 34*s.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.*; Canadian, 32*s.* to 34*s.* In Paris during January flour was quite steady, between 42*s.* 3*d.* to 47*s.* 5*d.* It declined the third week in February to 40*s.* 6*d.* to 44*s.* 10*d.*, but rose the following week to 42*s.* 3*d.* to 46*s.* 9*d.*

Indian Corn.—The standing quotations of the Mark Lane (London) market for American white were 32*s.* to 34*s.* per quarter; for yellow American, 28*s.* to 29*s.* In Liverpool the standing rates were as follows: American white, per 480 pounds, 31*s.* to 31*s.* 6*d.*; American yellow, 28*s.* 6*d.* to 28*s.* 9*d.*; Trieste, 30*s.* to 30*s.* 6*d.*; Danubian, 28*s.* 9*d.* to 29*s.* 6*d.*

WOOL.—The London market was, during the earlier weeks of 1873, quite firm for English fine and "deep-grown" wools, but this demand subsequently declined. The range of price was as follows: Southdown hoggets, per pound, 1*s.* 10*d.* to 1*s.* 11*d.*; Southdown ewes and wethers, 1*s.* 8*d.* to 1*s.* 9½*d.*; Leicester ewes and wethers, 1*s.* 11*d.* to 2*s.* 1½*d.*; Kent fleeces, 1*s.* 11½*d.* to 2*s.* 1*d.*

BUTTER.—Prices ranged in London, for Dorset, from 148*s.* to 160*s.* per cwt.; Friesland, 116*s.* to 148*s.*; Jersey, 102*s.* to 140*s.*; all kinds experience a heavy decline toward the close of February.

CHEESE.—In London cheese ranged as follows: Cheshire, 56*s.* to 86*s.* per cwt.; double Gloucester, new, 60*s.* to 80*s.*; Cheddar, 68*s.* to 90*s.*; American, 50*s.* to 76*s.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

APRIL, 1873.

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1873.

MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
Statistical Division, April 19, 1873.

SIR: I present herewith, for publication, a report of the condition of winter grain throughout the United States in the first week of April; a statement of the condition of farm-animals during the past winter, and of the prevalence and fatality of diseases among them during the past year; also, consular communications, (relating respectively to the "vine disease of France," and to "Dutch or Holstein cattle;") a letter from an official veterinary surgeon of France upon "epizootic catarrh;" a communication from Hon. R. B. Roosevelt on fish-culture; an account of the operations of the United States Commission of Fisheries, with statistics of markets, and "facts from various sources."

Respectfully,

J. R. DODGE, *Statistician.*

Hon. FREDERICK WATTS, *Commissioner.*

CONDITION OF WINTER-WHEAT.

On the first week of April a considerable portion of the northern belt of the winter-wheat area was covered with snow. The condition of that which was visible gave promise of general exemption from winter injury, leaving the crop subject to the meteorological vicissitudes of April. In the Middle States a great improvement upon the showing of last spring is everywhere conceded, especially in New Jersey and Pennsylvania. The prospect in the States south of Maryland is less favorable than last year, and there are indications of diminishing area in the cotton States, though acreage is not intended to be given in this report. Michigan, the only State of the northern border in which winter-wheat is mainly grown, presents green and vigorous growth, wherever snow has disappeared sufficiently to reveal it; and Ohio makes far more favorable returns than last year. In Kentucky a more checkered showing is made, giving the present appearance a decidedly unfavorable cast, with indications of future improvement as the weather becomes settled. In Indiana and Illinois the unfavorable returns outnumber the rose-colored; the dry autumn retarding seeding and germination, and leaving the plants too weak and shallow-rooted to endure well the effects of winter's changes of temperature. Similar causes affect the condition of wheat in Missouri, but a great improvement over last year is reported; and a still more favorable condition exists in Kansas. In Wisconsin, Minnesota, Iowa, and Nebraska, as is known, very little winter-wheat is produced, but full reports are given of such experiments. The indications from California all point to another year of great abundance, scarcely a county reporting unfavorable condition. As

a whole the wheat prospect at the close of winter is more favorable than at the same date in 1872.

There are places in the New England States where a portion of the very limited wheat area of that section is preferably sown with some hardy winter variety. If the protection of snow is unfailing, the growth of such wheat will be vigorous the present spring, the surface generally having been well covered in much of the northern belt from 2 to 5 feet deep. In York, Maine, the ground was covered from November 21 to April 1, when the tops of the stone walls began to appear. At the same date the snow was 5 feet on a level in Somerset, Maine, from 2 to 4 in Sagadahoc, and nearly as much in other counties. Two to 3 feet of snow covered the ground in nearly all of New Hampshire; there was a covering of 5 feet in Orange, Vermont, and ample protection in all parts of the Green Mountain State. Bristol is the only county in Massachusetts which reports wheat as visible, and there the fields are green and growing. The prospect in Hartford County, Connecticut, was never better; "wheat," in New London, "is better than for years," other counties reporting it as either not grown or covered with snow.

In New York there was much snow on the ground on the 1st of April. In Otsego County there had been one hundred and twenty consecutive days of sleighing; in Washington the surface had not been visible since the last of November; in Warren wheat was covered with 3 feet of snow; 2 feet were reported in Oneida; in Greene a covering of snow remained after December 15; and the wheat-fields were covered in Rensselaer, Suffolk, Montgomery, Chenango, Livingston, Jefferson, Delaware, Genesee, and other counties. The crop "looks remarkably well" in Sullivan; "fine" in Rockland; makes a good appearance in Albany and Tioga; is 25 per cent. better than last year in Yates, and in Seneca the plants are "small but healthy," and coming into fair condition. In Chautauqua it was quite badly frozen; in Erie a dry fall and severe winter leave the crop in an unfavorable condition; in Cattaraugus below average, and it is reported below average in Chemung, though the plants appear to possess vitality which promises vigorous growth in good weather. In Onondaga wheat "is not looking very fresh," the top being touched with frost, though it stands well, and the roots are alive; in Monroe the appearance is not an average. An average prospect appears in Niagara, Albany, Kings, Dutchess, and other counties, and little apprehension is expressed of the crop in the many localities covered with snow, though the weather of April may make a material change in the crop prospect.

Reports are received from two-thirds of the counties in New Jersey, all of which are favorable, with the exception of those from Salem and Cumberland, where evidences of the winter's severity are visible. The prospect is better than for three years in Sussex; in Cape May the early-sown fields look particularly green; in Warren a fine stand and vigorous growth are seen; Bergen makes a better show than usual, and other counties report average condition.

In many of the counties of Pennsylvania the ground was yet covered with snow; an aggregate snow-fall of 8½ feet is reported in Wayne; in Elk snow was 7 to 8 feet deep in situations, and there were drifts 12 feet deep. Very few reports indicate unfavorable condition, including those of Armstrong and Westmoreland; in Indiana the plants were "thrown out" to some extent by frosts; and in Fulton the early-sown fields were somewhat injured by the fly. In Adams the prospect is "better than for some years;" the crops "remarkably fresh and vigorous" in York; "condition seldom better" in Pike; "very promising" in Cumberland; in Northumberland so luxurious in the autumn that it was

pastured down; and favorable returns come from Wyoming, Lebanon, Erie, Wayne, Lancaster, Lawrence, Luzerne, Huntingdon, Mercer, Lehigh, Cameron, Chester, Lycoming, Tioga, and many other counties.

Warren County, Pa.—The steady cold winter, with the ground almost constantly covered with snow, has been highly favorable to winter grain. I have a piece of winter-wheat that looks as well as any I ever saw at this time of the year. The ground produced a fair crop of hay in July, was plowed about the 10th of August, manured on top after plowing and was sowed on the 21st of August. About twelve loads of barnyard manure, made the previous winter, was used to an acre.

In Delaware a full average condition is scarcely attained; Sussex reports 10 per cent. below, and Kent a fair prospect for upland fields.

An average condition of wheat appears in Maryland. In Montgomery, Somerset, Saint Mary's, Queen Anne, inferior condition is reported; the crop was well protected and is very promising in Washington; "healthy and vigorous" in Baltimore; decidedly good in Carroll; average condition is reported from Ann Arundel, Howard, Cecil, etc.

Queen Anne County, Md.—Wheat is looking badly, but within the past few days has made wonderful improvement. The best fields are marred by spots of winter-killed. It is yet too early to estimate the damages. Close observation, however, has convinced me that, even on flat lands, the drilled is much less injured than that sown broadcast. I tried an experiment this winter on a piece of land where wheat has sometimes been injured heretofore. On one-half I plowed in the wheat on four-foot corn ridges, the other half I drilled flat, and I now feel sure that the drilled wheat will yield fully one-third more than the other.

Saint Mary's County, Md.—The general condition of winter-wheat is *bad*. Much of it was seeded too late; the summer fallowing, owing to the dry weather, was too late to insure a good stand. It has been the worst winter on wheat that I have known for thirty years. Very heavy rains followed by intense cold. All wheat in wet or low lands is entirely destroyed, and the prospect for wheat and grass is very bad. No rye sown in the county of account.

More than fifty counties in Virginia made reports, nearly all more or less unfavorable. In Loudoun, "usually good;" in Prince George the crop looks well where the drill had been used in seeding, and in Orange it was promising, especially the drilled fields; in Nansemond, James City, and Northampton it was above average, and in Rockingham, except where the fly had injured a few early fields. It made a bad show in Spottsylvania in March, but has recovered a good degree of vigor. It was reported improving in Amelia, Augusta, Grayson, Frederick, and other counties. Heavy rains in February were injurious in Accomack; a few early-sown fields in Madison look well, but most of the area in wheat is unpromising; in Greenville the injury from frost was severe, but less so in drilled fields; in Middlesex the appearance was worse than for years. Some counties merely report "backwardness" and slow growth, which favorable weather will measurably remedy, and the apparently winter-killed may realize a similar improvement.

Essex County, Va.—Wheat looking badly—25 per cent. below average. One-third of the best wheat on the river-bottom has been winter-killed for want of proper drainage. That on rolling land is in an average, condition.

Henrico County, Va.—Wheat and rye are both looking badly, and as unpromising as may be. But the failure seems to be simply want of growth. It may be that a few really seasonable days will bring these crops out so as to change the prospect wonderfully in a few weeks' time. I do not think there is any serious defect except the cold, unpropitious weather, which has prevented growth and development.

Nearly three-fourths of the North Carolina reports indicate "backwardness, or "winter-killing." Stanly reports a good stand and superior prospects; Greene returns a good stand of small growth; in Mecklenburgh, Lenoir, Catawba, Madison, Carteret, Sampson, and Hertford, wheat presents a fair appearance; in Iredell it is in poor condition, except where fertilizers were used. Indications of improvement, under the influence of mild weather, is reported from various quarters.

Stokes County, N. C.—The stand is good, except in red puffy land, and even that kind of land has good stands where the drill was used. But as we have but little of that kind of land I will report an average stand.

Harnett County, N. C.—Winter-wheat and winter-rye are both in an average condition. As a general thing the ground was well prepared and the grain carefully put in.

Stanly County, N. C.—The condition of winter-wheat is good. The stand is excellent, and in many sections the growth is forward. The Tappahannock takes the lead in thrifty appearance, and the Fultz next. From the present looks of the Touzelle it promises to be a success; it tillers more than all the rest.

There is little wheat grown in South Carolina, or in any of the cotton States, except Tennessee and Texas. About half the reports from the former State are favorable, the others indicating a poor stand and unthrifty condition. Eleven counties in Georgia report condition from average to good, and thirty-two below average. Several report no wheat raised. The crop is "very good" in Dooly; "better than usual" in Jackson; "promising" in Laurens; "best for several years" in Troup. Of the counties reporting wheat in Alabama, about one-half make favorable returns; in Mississippi some injury from freezing is indicated, but fields look well in a majority of the counties in which any is sown. In Lee and Coahoma the Department wheat was in superior condition. Scarcely any wheat is sown in Louisiana, except for winter pasture, for which purpose rye is generally preferred. Three-fourths of the wheat reports of Texas are favorable. Grasshoppers partially destroyed the crop in Kendall, Atascosa, Bandera, and Medina. The prospect was never more favorable in Hunt; very fine in Leon, Lamar, and other counties. In Arkansas unfavorable reports predominate slightly. In Izard, condition is placed at 125, and in Marion the crop is almost a failure.

York County, S. C.—Winter-wheat appears to have fared badly. The frequent and sudden changes of temperature, during the winter months, with thaws and freezings, operated greatly to its injury. Much of it, on light sandy soil, is apparently killed out. The French Touzelle, of which I drilled three quarts, on a light loamy soil, seems to retain a full stand, and appears more vigorous at this writing than the Tappahannock, drilled beside it. Four acres of Tappahannock, sown broadcast, on a different soil, containing more clay, has wintered better than any other variety I have, except the Touzelle.

Cobb County, Ga.—The comparative condition of winter-wheat is bad. There is much complaint of winter-killing on the high lands. On low lands the wheat is drowned out and washed away by the freshets caused by the heavy rains.

Gilmer County, Ga.—Owing to late seeding, excessive rains and freezes just after floods, the crop of winter wheat and rye is very badly injured.

Laurens County, Ga.—There is very little wheat sown. Planters have often been disappointed by rust, and many discouraged, but those who sow yearly find it very profitable for home use. Every planter can raise his wheat if he will, especially by getting his seed from Virginia or Maryland every second year at least. I have tried this plan and am well pleased with it. Our planters have run into the ruinous error of planting too much cotton to the neglect of provision crops. It is bankrupting the country.

Gadsden County, Fla.—Wheat in this county is only on the scale of an experiment. That from the seed sent out by the Department is doing very well, and gives flattering promise of perfect success. I measured some bunches of the Virginia variety which gave a height of 3 feet 9 inches, and from present indications will begin to head in the course of ten to fifteen days. The French wheat is not quite so tall, but both are well tillered. It was seeded on the 1st of November, and has not been the least affected by the cold.

In Tennessee the unfavorable returns outnumber the promising. The growth is generally small for the season, scattered and patchy, but rapid improvement is indicated at points where the season has been favorable for rapid development.

Montgomery County, Tenn.—Smaller than usual on account of late planting, and thinner than usual on account of the freezing out. My opinion is that we shall have a better crop than is expected. There is no telling the "come out" in wheat. But there is no doubt about it, wheat and rye are badly injured. We will know by the middle or last of April.

Monroe County, Tenn.—Wheat sown on clover-fallow is looking well, especially the early sown. That on stalk-land is badly winter-killed.

In more than half the counties of West Virginia there is complaint of injury from frost or unthrifty appearance. Warm weather will greatly improve the latter defect. The principal injury appears to have been done in March, after the disappearance of the winter's snow. While the surface became bare in places, the temperature was too low for growth, even in counties so far south as Cabell. The counties in which it looks best are Jefferson, Hancock, Taylor, Pocahontas, Tyler, Berkeley, Barbour, Hardy, and Morgan. It is 20 per cent. better than last year in Berkeley, well tillered and vigorous. Where it is fairly started in these counties it is growing fast.

In most of the counties of Kentucky the appearance is reported unpromising. In Shelby the "early sown stood best; the early drilled seems to have done better than broadcast;" in Warren it is "good, better than expected;" in Lawrence "good on new land;" in "fair condition" in Boone; "looks tolerably well" in Trimble. It is thought that few fields will be worth harvesting in Jackson; in Livingston wheat is poorer than for many years; and fields have been plowed up in Owsley and Russell.

Hardin County, Ky.—Wheat is in a poor condition; you would hardly recognize any wheat in three-fourths of the wheat-fields, at a distance. Drilled wheat is still in the ground, but broadcast is badly lifted out by freezes. Rye looks badly; it made no growth last fall.

Fayette County, Ky.—Wheat has wintered badly; that which was drilled on clover-ground has done well; all other kinds much injured, probably to extent of 30 per cent. Rye has done very well.

In Ohio the returns, which are quite general, are favorable in a large proportion of the counties. Among those in which condition is most promising are Ashland, Adams, Ross, Vinton, Erie, Geauga, Morgan, Stark, Perry, Fairfield, Jefferson, Defiance, Crawford, Lorain, Logan, Mahoning, and Warren. In Noble it is better than for many years. In Morrow many fields, sown early, look well. The counties making less favorable reports are Carroll, Delaware, Meigs, Marion, Medina, Scioto, Wyandot, Washington, and Urbana.

Athens County, Ohio.—Made little growth before winter. Have had many cold, chilly winds, killing much grain, and rendering that left alive very weak and unpromising.

Williams County, Ohio.—Winter-wheat, just now, is looking very badly. It was covered with snow all winter until the last week in February, when there was a thaw that melted the snow all off, leaving the wheat very green and tender-looking. Then there was a change in the weather, the thermometer running down to 8° below zero in about twelve hours. And since then wheat looks as though it had been considerably scorched, in fact a great deal of it is entirely killed.

The crop was well protected by snow in Michigan, (the principal winter-wheat-growing State of the Northern border,) and scarcely any returns indicate unpromising condition. Ice has caused some injury to fields in Branch, and to some extent in Wayne. In many counties the covering of snow was not yet removed, and a possibility existed of injury by sudden changes of spring weather. In Saint Joseph the prospect was somewhat above an average, but not quite so good as last year. In Montcalm the crop "never looked better," and was above average in Lenawee, Lapeer, Macomb, Jackson, Ottawa, Washtenaw, and Shiawassee. A majority of the counties report average condition.

A few counties in Indiana report superior condition. In Shelby, "better than for several years;" in Randolph, 23 per cent. better than last year; in Scott, above average; in Hancock there appears a difference of one-third in favor of drilled wheat. In sheltered locations the crop looks well in Laporte. In many counties there was little snow,

with cold winds, resulting in injurious freezing, except upon spots covered with snow or sheltered by timber. The winter-killing was worse than for several years in Wayne, Carroll, Perry, Edwards, and Macon, a part of the area in the latter being plowed up and sowed to oats. Of the remaining counties reported, about forty in number, about half indicate average condition.

Decatur County, Ind.—The condition of wheat is bad; the figures 60 would probably approximate the comparative condition. Much of it was actually frozen to death. The first week of March was nearly as cold as any part of winter, while the ground was bare of snow, and frequent freezing and thawing has damaged it badly.

Howard County, Ind.—The drought of the fall caused considerable wheat to perish after germination, and what survived to be small, but the snows have so protected it from injury during the winter that we have reason to hope that a favorable spring will give us a full average crop.

Morgan County, Ind.—Wheat is fully 100, but in low, undrained land will, undoubtedly, be injured by the recent rains, as the ground is full of water.

Parke County, Ind.—The condition is a little above the average of seasons, from the fact that wheat was drilled and the ground better prepared than usual. March has been the hardest month of the winter on wheat.

Warrick County, Ind.—The present prospect of winter-wheat is good. The unusual amount of snow (counteracting the severity of the weather) seems to have furnished a natural stimulus, and greatly vitalized the appearance and growth of this cereal.

In Illinois the reports range between average and "bad," very few "good." Some fields were still covered with snow, others were bare, the wheat scarcely started, or growing very slowly. Drought was severe in many counties last fall and germination late, wheat making little show at the beginning of winter. Where covered with snow it is in vigorous condition. In Hancock it is noted that "the drilled looks 3 per cent. better than the broadcast." In Pike the bottom-lands promise a good crop; in Clark early-sown wheat looks well. In Macon half the area has been plowed and put in oats and spring wheat; in Edwards the prospect is "worse than ever known."

Perry County, Ill.—Three weeks ago wheat appeared to be in a wretched condition. Since that time its appearance has improved, so that it is now nearly an average condition.

Vermillion County, Ill.—Wheat looks well considering the very dry weather at seeding-time. Plants got a poor start last fall, but have come through the winter well. The crop will probably be below an average per acre, and not more than two-thirds of a crop sown.

Saint Clair County, Ill.—Winter-wheat has been excellently protected by a fine covering of snow, and hence has very much improved under the snow, and fields that looked quite bare last fall are now green with fine growing wheat. We have to-day (March 26) another severe cold spell, with about one inch of snow on the ground, and the thermometer down to 20° above zero. I do not think it will affect wheat in the least.

Cook County, Ill.—We long since ceased to gamble on winter-wheat growing. Every shilling we ever made on an average cost us $1.

Sangamon County, Ill.—Winter-wheat, where drilled in, looks fair; that sown broadcast is mostly destroyed. Winter-rye looks well.

Franklin County, Ill.—The comparative condition of winter-wheat with us now is very unfavorable indeed, owing to the very dry summer and fall. Very much wheat that was sown at the usual time, from the 12th to 20th of October, did not come up last fall, or if it did the plant was very feeble. During February we had a warm spell of weather, which caused much of it to sprout, but it turned very cold again, with high dry winds, which killed most of the plants, and much of the seed rotted. At present many fields have a barren and diseased appearance, and many fields are being plowed up for corn, and many others will be. There are some fields that show a fair prospect, and which were mostly drilled or the seed plowed in.

The winter-wheat of Wisconsin, Iowa, and Minnesota is scarcely worth mentioning, except to show the possibility of growing it. It is reported in good condition in Trempealeau and Marathon, (Wisconsin;) average in Adams, Dunn, and Kewaunee; but generally injured by freezing. In Dodge County there is 50 per cent. more grown than for-

merly. In Minnesota it is said to be in good condition in Becker, Isanti, Goodhue, McLeod, Houston, Sibley, Steele, and Washington. In Winona it is badly injured where not sheltered.

Rice County, Minn.—Winter-wheat is not a sure crop with us, though in some seasons it has yielded splendidly, from 25 to 40 bushels per acre. This was the case two years ago; but last year it was nearly a failure. Spring-wheat is more reliable, and is in fact worth more per bushel than winter.

Scott County, Minn.—But very little is planted in this county. What is needed here is a hardy winter variety. Four quarts of a winter variety, which I received from the Department in the fall of 1871, was planted as late as October 1. The product of the four quarts was four bushels, which was sown last fall. The snow has just disappeared, and this wheat is looking very well. Rye generally looking well. But little is sown.

Carver County, Minn.—Winter wheat and rye look very well, but the growth of winter-wheat is too much neglected. The farmer should not be discouraged by one failure, which they will have sometimes. The yield is five bushels to the acre more than spring-wheat, and the price fifteen cents per bushel greater. Tell them to try more winter-wheat; it will pay. If it fails the land is in better condition for spring crops.

Iowa reports a very small area in poor condition. In Fremont that which was drilled was good; Ringgold, good; Appanoose and Jefferson, average; winter-killed in Wayne, Adams, Lucas, Johnson, Polk, Allamakee, Madison, Marion, Louisa, Jackson, and Des Moines. "None grown" was the report in a majority of the counties.

Montrose County, Iowa.—Winter-wheat presents a worse appearance than for many years, though the drill has been almost universally used. This is accounted for because of the character of our snows during the past winter. Although we were visited by heavy snow-falls, it was so dry and accompanied by such strong winds that the snow was drifted to a great depth in lanes, roads, and against fences, while the great body of the field would be comparatively bare. Being thus without cover and exposed to unheard-of freezes, there will be little winter-wheat except on fields protected by bluffs or next to the fences where it was covered with snow. Winter-rye looks well.

Page County, Iowa.—Fall-wheat looks very bad, especially that sown by hand, many fields being entirely killed. The drilled is much better, but under the most favorable circumstances will not produce more than half or two-thirds of an average crop.

The promise is better in Missouri than last spring, but still not good. In Clinton the prospect is "very good;" "better than usual" in Adair; "unusually fine" in Benton; "better than for three years" in Johnson, and doing well in Shelby, Linn, Reynolds, Pettis, Daviess, Callaway, Ralls, Lawrence, and other counties. In Carroll early wheat looks well; in Moniteau that protected by timber is safe; "not quite so well as usual" in Stoddard; "50 per cent. better than last year" in Montgomery; "better than last year, but not first-rate," in Jackson. With good weather and exemption from insects, there is still a possibility of an average crop.

In Kansas a still better prospect is indicated. In Linn wheat looks "as well as it ever did;" in Montgomery it was "never better;" "better than for five years" in Neosho; "very fine" in Crawford; in Bourbon "200 per cent. better than last year;" the "prospect could not be better" in Cherokee. Rain is needed in Marion, and in Osage the winter's rains wrought some injury. In Shawnee "drilled wheat is good;" in Jefferson "early-sown is very fine;" in Marshall "late-sown is badly killed." Several counties return complaints of poor condition, among them Lyon, Chase, Ellsworth, Rice, Washington, Smith, Ottawa, and Riley.

Audrain County, Mo.—Winter-wheat looks very well, but a small area sown on account of the chinch-bug being so destructive. Very little rye sown for the same reason.

Franklin County, Mo.—Wheat, on land well prepared and the grain drilled in, looks well.

Greene County, Mo.—Wheat is very backward, but on account of an unusual amount of snow this winter it is looking well. Ground well covered.

Jasper County, Mo.—Wheat looking 25 per cent. better than April 1, 1872, drilled be-

ing in better condition than broadcast, and early drilled looking much better than late.

Vernon County, Mo.—Winter-wheat was mostly sown very late on account of chinch-bugs, and can now hardly be discovered. Has not stooled any as yet, but the bud is healthy and looks as well as usual for this time of year except being late.

Wilson County, Kans.—I have never, in any State, seen a better (if as good) prospect for an abundant wheat crop than we have here at this time.

Labette County, Kans.—Better than ever was known in the county, and it goes to prove the facts that care in seeding, sowing early, and using drills is the great secret of raising wheat. We have now (April 1) any number of fields on which the wheat is from four to six inches high, in which a rabbit can hide.

Republic County, Kans.—Winter-wheat is in fair condition; that plowed or drilled in quite early on new ground, or very late, decidedly the best. Ground four or five years old and in good condition (very loose) is killed some. The winter has been severely cold.

Woodson County, Kans.—An unusual snow-fall has favored the wheat crop, and the prospect is good for a large yield. The winter held on steady until the first of March, and then a fine rain fell, and spring, with its joyous sunshine, set in, and farmers are jubilant over the prospect of a fruitful season.

Doniphan County, Kans.—Winter-wheat was somewhat damaged, and much of the finer kinds killed outright. Tappahannock wheat, sent out by the Department, was sown on excellent ground, came up and grew nicely, but was killed by the first hard frost. One hundred acres Lancaster wheat, sown by a neighbor, was killed. Much of the wheat sown on old ground is killed or injured, more or less. Wheat sown in corn-fields or on new ground is much better.

McPherson County, Kans.—There were about 2,000 bushels sown last fall, but the condition of it now is very hard. I would say that about half of it is dead. This failure is the fault of the farmers, as they are mostly all new beginners in that business.

The reports from California are very encouraging. There is no positive statement of poor condition. In Stanislaus it is stated that wheat is not equal to that of last year by 10 per cent., and that rain is needed. The prospect is better than several years in Mendocino. The plant is thought to be forward for the season in Del Norte. Rain is needed in San Diego. The following extracts further illustrate the condition of wheat in California:

Placer County, Cal.—I answer by saying that during a residence of twenty-three years in this county I have never seen the prospect for wheat as good as at the present time. If there is nothing happens to our wheat crop it will astonish the world.

Alameda County, Cal.—Wheat and other grain is looking full more than average at this season of the year, and if nothing should befall the crop we will have an abundant harvest. There was a larger breadth of wheat planted the past fall and winter in this State than ever before in one season. Many fields of early-sown wheat now stand over two feet high.

Santa Clara County, Cal.—Wheat is in good condition; never more promising at this season of the year than now. An occasional rain from now until the 1st of May, and the harvest of 1873 will be the most bountiful ever reaped on this coast by 75 per cent., provided the rust and smut do not attack the crop.

San Joaquin County, Cal.—Grain of all kinds never looked better or more promising at this season of the year, and never has there been so large a surface covered, with wheat particularly. It is estimated that over 50,000,000 bushels will be raised in the State.

Contra Costa County, Cal.—Our rainy season setting in early was favorable to early seeding under most favorable conditions, and justifies the hope of a very abundant yield, even an increase on our last year's crop. Earliest wheat and barley from 6 to 12 inches high and very thrifty, with slight exceptions.

Sonoma County, Cal.—Our winter-sown wheat is in very fine condition, and never were the prospects more flattering for a bountiful crop as at present. Should we be favored with the usual spring rains Sonoma County will exceed in yield all its former crops and show a larger average yield than any other county in the State.

The prospect in Oregon is exceedingly good, not an unfavorable return being received. Several reporters say that the indications of a good crop never were greater.

CONDITION OF SHEEP AND CATTLE.

Though the past winter, over much the larger portion of the country, has been one of extraordinary and protracted cold, it has on the whole been favorable for farm animals. The weather has been comparatively uniform and dry. There have been comparatively few sudden changes and very few storms of rain and sleet followed by freezes. One consequence has been unusual exemption from wide-spread suffering and death which wet winter storms inflict upon unsheltered farm animals, especially sheep. The severity of the winter in certain sections has induced greater care, and more attention to feeding. Farmers are learning that care and kindness to these useful creatures are repaid with increase of profit. Our correspondent in Labette County, Kansas, states: "I have learned from observation that a cow, when well sheltered and watered, can be kept on less than one-half the feed required when left to the exposure of winter storms." Those who now neglect to provide suitable shelter in winter for their herds and flocks, if they would carefully observe and study results, would reach a similar conclusion. The agricultural districts in this country are very limited in which farmers can *afford* to winter stock without any provision for sheltering and feeding them.

In the Pacific States, and in the Territories, except Utah, the winter appears to have been unusually mild and pleasant. In the Gulf States, especially Texas, there has been an exception to the general exemption from storms of rain and sleet. The consequences, as will be seen from the figures and extracts which follow, are manifest in comparatively low condition and heavy losses. In the Northwestern States much suffering and considerable loss among cattle and sheep were occasioned by the unprecedented snow-storm of January 7. On the whole, taking the country together, owing to the circumstances above referred to, in connection with a general abundance and cheapness of feed, both cattle and sheep have come out of winter-quarters with much fewer losses, and in a condition much better, than average. The returns make it quite manifest that wherever they have been properly sheltered and fed, flocks and herds have come through the winter in a healthy, thrifty condition.

CONDITION OF CATTLE.

Out of 1,032 counties reporting with some degree of explicitness, 238 return average condition; 500 above, 294 below. New England returns 42 counties, 5 of which are average and 37 above. York, Maine, reports "never saw them looking so well;" Hillsborough, New Hampshire, "never better;" Chittenden, Vermont, "better than for a number of years;" Hampden, Massachusetts, "extra," and Franklin, "25 per cent. above average."

In some returns the description of relative condition is too vague to admit of classification as either average, above, or below. Such counties are not included in the classifications which follow. Under "average" are placed not only those so reported explicitly, but impliedly; such as, "in fair condition," "pretty good," "good as usual," &c; "above average" includes those returned as "in good condition," without any qualifying epithet, and all grades described by stronger terms, among which "excellent," "splendid," "first rate," "never better," "better than ever before," &c., abound. The extracts which follow the summary given in figures, will be mainly such, or specimens of such, as assign a reason for the relative condition.

States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.	States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.
Maine	10	9	1	.....	West Virginia	30	9	11	10
New Hampshire	6	5	1	.....	Kentucky	40	11	11	18
Vermont	10	8	2	.....	Missouri	55	32	13	10
Massachusetts	8	7	1	.....	Illinois	51	35	13	3
Rhode Island	2	2	.....	.....	Indiana	53	24	18	11
Connecticut	6	6	.....	.....	Ohio	43	25	11	7
New York	36	24	7	5	Michigan	28	22	3	3
New Jersey	14	8	6	.....	Wisconsin	29	16	9	4
Pennsylvania	41	24	12	5	Minnesota	34	19	11	4
Delaware	1	.....	.....	1	Iowa	60	42	12	6
Maryland	10	1	3	7	Kansas	33	30	2	1
Virginia	61	14	17	30	Nebraska	12	7	3	2
North Carolina	48	17	16	15	California	20	16	2	2
South Carolina	6	1	3	6	Oregon	6	5	1	....
Georgia	49	17	13	9	Nevada	1	1	.....	....
Florida	15	5	5	5	Colorado Territory	5	5	.....	....
Alabama	21	4	4	13	Dakota Territory	6	6	.....	....
Mississippi	28	5	7	16	Montana Territory	2	2	.....	....
Louisiana	20	8	1	11	Washington Territory	1	1	.....	....
Texas	53	7	8	38	Utah Territory	9	3	3	3
Arkansas	20	6	3	11	New Mexico Territory	1	....	1	....
Tennessee	43	10	5	28	Idaho Territory	1	1	.....	....

NEW YORK.—*Chemung:* Good. Hay having been scarce and dear, much grain has been fed, thus maintaining flesh and thrift. Grain has been relatively much cheaper than hay. Corn is worth in market $20 per ton; hay, $22; straw, $12. *Seneca:* Thrifty. Cattle and sheep, as a rule, are well sheltered and well cared for in this county. *Genesee:* Not as good as last year; still buried in snow, and many farmers short of fodder. Hay, $15 per ton.

NEW JERSEY.—*Warren:* Look better than for many years.

PENNSYLVANIA.—*York:* Poor, on account of scarcity of hay. *Cumberland:* Better than for many years. *Cameron:* Rather below average. Feed scarce. *Clearfield:* Better than usual. Feed plenty and cattle scarce. *Dauphin:* Looking unusually well. Long, severe winter, with scarcity of hay, but corn-fodder plenty; and it appears that cattle winter better on that than on hay. *Bucks:* Very good. Owing to the high price of hay and low price of grain, more grain than usual has been fed. *Beeves:* Better than was expected. Cheap corn and better care.

DELAWARE.—*Sussex:* Ten per cent. below average.

MARYLAND.—*Baltimore:* About 60 per cent. of the cattle are poor and much prostrated, owing to scarcity of hay, and consequent poor and insufficient feed. Many farmers, however, as well as dairymen, are keeping their cows in good condition. Experience has taught us that cows poorly fed are a loss. *Somerset:* Quite thin from scarcity of feed, occasioned by extensive drought last summer. *Howard:* Very poor; no grass last summer; no hay this winter. Feed scarce and high.

VIRGINIA.—*Clarke:* Worse than I have ever known. The winter has been intensely severe, and unusually long. Provender very scarce, and cattle were in poor condition when winter set in, in consequence of the long drought of last autumn. *Page:* Good, owing to much better care than formerly. Our people are providing good shelter for stock. We find a great saving in food by so doing. *Greenville:* Average. This people devote their time so much to cotton and tobacco that scarcely enough forage is stored for the work-horses; consequently, at this season of the year, it is no uncommon sight to see bales of northern hay hauled fifteen or twenty miles from the depots into the country. This hay, when brought home, costs at least $50 per ton. *Essex:* Exceedingly thin and poor. The increased acreage of cotton and pea-nuts has so lessened the quantity of forage that but few have been well fed. *Grayson:* Good breeds in good condition. So little attention has hitherto been given to proper sheltering that many, as heretofore, are in an emaciated condition. *Nelson:* Fair. Our farmers are slowly but surely learning the importance of sheltering their stock in winter. *Halifax:* Better than last winter. Too little attention paid to housing, feeding, and care of stock. *Fauquier:* Better than was expected. The low price of grain induced farmers to lengthen out the short supply of hay by feeding more grain. *Madison:* Bad, owing to severe winter, scarcity of food, and careless treatment.

NORTH CAROLINA.—*Chowan:* Bad, owing to the extremely cold and wet winter. *Rutherford:* Good. Feed plenty.

SOUTH CAROLINA.—*Clarendon:* Very poor, owing to intensely cold winter and want of food and shelter. *Chester:* No winter quarters to come out of.

GEORGIA.—*Harris:* Pretty good. The hardest winter we have ever experienced. *Dawson:* Those that have been housed look well; those that have been exposed, in poor condition. *Cobb:* Those that have not been sheltered and well fed in very poor condition. The winter unusually cold and wet. *McDuffee:* Worse than for the last ten years. The oldest inhabitants say they never saw the cattle so poor and weak as they are now, and two-tenths will be sure to die this month. One farmer told me he had lost twenty-four out of forty head. We have had so much cold, snow, sleet, and rain that our cattle have died from the effects of the same. Our people do not prepare shelter for their cattle. The winters continue to get colder, and the cattle die out. We shall soon have to keep them better housed, or look to the West for our beef in summer and fall. *Heard:* Very poor for want of food and attention. *Pulaski:* Better than for the last ten years. *Oglethorpe:* Better than common where housed. *Jefferson:* Worse than for several years, owing to the unusually severe winter, a general want of shelter, and a general scarcity of food. *Brooks:* Better than common, owing to the dry winter.

FLORIDA.—*Gadsden:* Unusually reduced, owing to the severity of the winter and the want of proper sheltering. *Levy:* Good in some parts. The dry weather of the past fall and winter improved the low range, but on the high woods and along the rivers, where the swamps were overflowed in 1871, a great many have died. *Madison:* Fair, considering that no "winter quarters" are provided, and they are generally left to shift for themselves. *Liberty:* Better than for ten years. *Suwannee:* Good; some about fat enough for beef. *Wakulla:* Good; many of the dry cattle now fit for beef.

ALABAMA.—*Lauderdale:* Very bad. Very few provide cover for cattle, and the last winter being very severe, they suffered, and many died. *Barbour:* Poor; no "winter-quarters." *Wilcox:* Very bad; spring backward, and no provision for feeding, and so they are dying from emaciation in large numbers. *Marshall:* More poor cattle than I ever saw before. The tanners have bought a large number of "poverty hides."

MISSISSIPPI.—*Attala:* Never worse; bad winter and lack of feed. *Kemper:* Looking badly; no winter-quarters, and the winter unusually severe and protracted. *Tishemingo:* Weak for the want of food and shelter. *Madison:* Bad; the severest weather within the memory of "the oldest inhabitant." *La Fayette:* Average; the open woods and fields their only winter-quarters. *Jones:* Those fed during the winter in good condition, those not fed in bad.

LOUISIANA.—*Avoyelles:* Excellent, although last summer, autumn, and winter the most protracted and severe drought ever known prevailed here. The winter was one of the coldest on record, nevertheless the cattle have come out of the swamps in unusually good condition. Few, if any, perished. *Iberia:* Very poor; never winter-fed. *Carroll:* Very bad, owing to the extremely cold winter; no weather-sheds, and in many cases nothing to eat when the ground is covered with snow. Some feed cotton-seed; in such cases there has been little or no loss. *Richland:* Many have died from exposure and insufficient food. *West Feliciana:* Poor and bad; no attention paid to feeding in winter. *East Feliciana:* Better than usual; run at large in winter. *La Fourche:* Better than last year, owing to the dry winter.

TEXAS.—*Barnet:* Very bad, owing to severity of the winter and scarcity of food. *Red River:* Very poor; many have died. *Austin:* Worse than since 1860. Loss very heavy. *Fort Bend:* A large number of the cattle, which are never fed here in winter, have died from cold and hunger. *Collin:* Poor. Have to depend on the range. Many have died. *Navarro:* Very bad, owing to the continued drought in summer and fall, cutting off the supply of grass, followed by an extremely cold and wet winter. *Bandera:* A severe, cold storm of sleet in the latter part of January killed an immense number of cattle. *Atoscosa:* Minus at least one-third, and what are left are quite feeble. *Fayette:* Very poor and weak; winter very severe, and where they had to depend on the range alone for food, a great many died. *Upshur:* Good; farmers were better prepared to feed their stock than usual. *Williamson:* Wintered well; grass now good; stock improving very fast. *Kaufman:* Poor; fully 50 per cent. have died this winter from the extreme severity of the weather and lack of grass to keep stock in living order, the range having given out. The mortality has been greater with stock-cows and one and two year old cattle. *Coryell:* Thin. The main cause is what we call "the heel-fly," which is an insect about the size of the common gad-fly, but has a long tail like the bat-fly. On warm days in February and until the latter end of March it troubles our cattle very much. It makes them perfectly frantic. They will dash over the high bluffs or anything that comes in their way. They cannot feed, and their only relief is to stand in water. The fly seems to only trouble them about the feet. The result is that a great many die every spring for the want of sufficient time to graze. *Lavaca:* Winter-quarters for cattle and sheep are not known in this county; everything in that line is left to shift for itself. If they survive, well and good; if not, their owners go and skin them and sell the hide for nearly as much as the animal would bring alive at present prices here. Thousands almost have died during this winter, which was very severe, and those which weathered it through are very poor yet, but improving, as our grass on

the prairies is already quite good. *Titus:* Rather bad; not housed; seldom fed. *Cooke:* Very bad; the range having been burned off in every portion of the county.

ARKANSAS.—*Jefferson:* Those that have been sheltered and well fed look well; those that have not, very bad. *Montgomery:* Very poor. The excessively cold and hard winter has told fearfully on cattle that depended on the range. Many cows and some yearlings have died in March. *Independence:* Most miserable. Corn has not been so scarce at any time since the war. Hundreds of cattle and hogs were early in winter turned out to live in the woods, or to die of starvation, and fully 10 per cent. of the cattle and hogs of the county have perished in the long and severe winter. *Perry:* Worse than for twenty years. The exceeding long, cold winter has resulted in a loss of, say, one-fourth of the stock-cattle. *Izard:* Poor, for the want of food and shelter. *Madison:* Better than usual.

TENNESSEE.—*Robertson:* Look bad; very few of our farmers shelter their stock. *Loudon:* Bad as I ever knew them, in consequence of our long, severe winter, cold rains, and want of shelter. *Hamilton:* Thin; winter very severe on them; very few being housed. *Gibson:* Better than usual; less exposed to sudden changes, drizzling rains, &c. *Dyer:* Have stood the winter well; as a general thing have been well fed. *Hickman:* Better than last year; our county had about 250,000 bushels of pea-nuts and plenty of hay from them, which was fed freely; it is the most nutritious hay we raise, particularly for cattle. *Wayne:* Above average; have been better cared for than usual. *Grundy:* Look exceedingly well.

WEST VIRGINIA.—*Jefferson:* Thinner than usual; short pasturage last year; put into winter-quarters rather early; an unusually severe and protracted winter and a scanty supply of forage accounts for the thin condition. *Pleasants:* Stock owned by small farmers went into winter-quarters very thin and have not improved on half rations with exposure to extreme cold; owing to the low price of corn, the majority of large farmers have fed it to their cattle very liberally, and, consequently, they are in better condition than usual. *Boone:* Generally poor; farmers have fed longer and closer than for many years; feed is now scarce, and some cattle are dying from want.

KENTUCKY.—*Trimble:* Look badly, owing to the severe winter and want of shelter. Those which have been sheltered and provided for look exceedingly well. *McLean:* Better than usual; better cared for. *Oldham:* Below average. Have done well where well cared for. *Ohio:* Below average. Exceedingly cold, hard winter, winding up with scarcity of feed.

MISSOURI.—*Linn:* Average; the winter long and hard, but dry and unchangeable, and feed abundant and cheap. *Pemiscot:* Not quite average, except those that have been stabled and regularly watered. *Washington:* Average; winter very hard on those having no shelter. *Ralls:* Better than for many years past. *Worth:* Fair, but with less flesh than when they went into winter-quarters; which is to be expected from the kind of quarters provided, which, in most cases, is a straw-stack, a stalk-field, or such shelter as they are able to find in some fence-corner. However, a few of our farmers provide open sheds, covered with prairie-hay, closed up on the north, east, and west, and left open on the south. *Nodaway:* Strong, but thinner than usual. An unusual number of calves and lambs have frozen to death in dropping.

ILLINOIS.—*De Kalb:* Good; the weather has not been changeable, though intensely cold. When corn is from 15 to 20 cents per bushel cattle always winter well. *Cook:* Good, owing to the large corn-crop. *Winnebago:* Average; the winter has been very severe and springs low. A few herds have suffered for want of water. Corn has been abundant and cheap, and in all cases where water has been convenient, cattle are in good condition. *Franklin:* Better than usual; received much better attention.

INDIANA.—*Wells:* Good; more grain fed than usual. *Harrison:* Thinner than usual; light hay-crop, and unusually long and cold winter. *Lake:* Splendid; the most favorable winter for stock for a long time. *Ripley:* Pretty fair. The farmers generally provide good shelter for their stock, which goes far in rendering stock in good condition in spring, besides a saving of one-third in food.

OHIO.—*Champaign:* Good; severe and protracted cold, but little rain. *Medina:* Generally pretty good; many thin from scrimping.

MICHIGAN.—*Tuscola:* Much better than usual. *Shiawassee:* Good; never better. *Kalamazoo:* Rather lean and debilitated.

WISCONSIN.—*Iowa:* Never better. *Pierce:* Excellent. *Jackson:* Never looked better, where well housed and fed; where not well taken care of, looked badly. *Fond du Lac:* Quite well where properly cared for; some lost for want of shelter and food. *Green Lake:* Thin, and will be more so, for hay is becoming scarce.

MINNESOTA.—*Washington:* Good; better than average; from its being a severe winter they have received extra good care. *Dodge:* Thinner in flesh than usual, owing to the unusually cold and long winter; a few have died from poor shelter and scant feed, but the greater portion will come out in fair condition. *Scott:* Good, except in some cases of insufficient food.

IOWA.—*Dubuque:* Looking well. The most severe winter for eighteen years; the good condition is attributable to the fact that most of our farmers have good stabling for

their cattle. *Muscatine:* Not as good as usual, owing to the exceedingly cold winter and, in many places, scarcity of water. *Johnson:* Fair; winter severe, but grain and hay abundant and cheap and stock have been well fed. *Jasper:* Never so good; corn cheap and plenty. *Lee:* Looking worse than usual; scarcity of rough feed. *Shelby:* Not so good as usual; an unusual number have died in dropping their calves.

KANSAS.—*Cherokee:* Excellent, owing to the abundant crops. *Johnson:* Thin; poor shelter, and extreme cold weather. *Labette:* Better than ever known in this county. The past winter said to be the hardest ever known in Southern Kansas—thermometer down to 18° below zero—but such bountiful crops were raised the past season, besides a great amount of prairie-hay cut, that cattle have had all the feed they could eat; besides, farmers have had better shelter for their stock, which is the biggest half in their feeding. *Lincoln:* All have done well except a drove of 500 from Michigan, which arrived here late in October in very poor condition, and lost 102.

NEBRASKA.—*Richardson:* Rather poor; hard winter. *Pawnee:* Never known to be better. *L'Eau qui Court:* Fair. Some farmers do not feed till their stock get poor; those have the most losses.

CALIFORNIA.—*Sonoma:* With rare exceptions neither cattle nor sheep are put into "winter-quarters." They have no other shelter than that afforded by nature. During seven years' residence in this county we have not known a winter so favorable as the past to stock. The long, cold rains, so injurious to stock in poor condition, have not prevailed; have had no severe storms. The rains have been mild and warm, and alternated with warm sunshine, so that grass has grown well, and the stock are in a thriving condition. *Napa:* Unusually good. Our beef has been superior to that of any former winter for many years. Stock-cattle have kept good on mountain and river pasture; no food given; no shelter. *Contra Costa:* Excellent. Sold a lot of beeves on the last day of February fully as fat as the best stall-fed. *Del Norte:* Better than usual; winter the warmest since 1863. *Mendocino:* Better than ever before; now fattening on the new grass. *Stanislaus:* Poor, from the want of proper care and food. *San Diego:* Suffered and 3 per cent. died for want of pasture, owing to drought.

OREGON.—*Umatilla:* Fine, without being fed—running on the pasture that nature has furnished. This county being a common meadow, and the winter being mild, we seldom have to feed any. *Douglas:* Splendid. *Yam Hill:* Excellent; much better than usual. *Grant:* Good; many of them good beef.

NEVADA.—*Esmeralda:* Very good; favorable winter.

COLORADO.—Fine; all above average. *Conejos:* Good; they run at large, and are never fed. *El Paso:* All right; fat beyond conception in the East. Have seen the heart of a yearling so completely enveloped with fat that the heart itself could not be seen. Steers, four years old, slaughtered off the range, net 1,400 to 1,500 pounds.

DAKOTA.—*Minnehaha:* Fine; the weather cold, but equable.

UTAH.—*Sevier:* Good as usual; the winter very mild. *Tooele:* Very poor; owing to heavy storms in February, many died on the range. *San Pete:* Very poor. The snow has fallen to an unusual depth, covering up all feed, and cattle have had to be put in yards and fed on chaff, straw, &c. *Rich:* Excellent. *Salt Lake:* Good.

MONTANA.—*Missoula:* Better than usual; more hay, and less shifting for themselves. *Lewis and Clarke:* Much better than previous winter; open and mild winter.

IDAHO.—*Ada:* Excellent; in most instances have improved during the winter, and plenty of good beef is coming from the ranges.

NEW MEXICO.—*Santa Fé:* Fair.

WASHINGTON.—*King:* Good; very mild winter; no snow, and very little cold weather.

CONDITION OF SHEEP.

The comparatively dry winter and the general cheapness and abundance of feed have combined, with the advanced price of wool, not only to exempt sheep from exposure, want, and disease, but to keep them in a condition of unusual health and thrift. One correspondent emphasizes the remark that "*wool will not grow on poor and poorly fed sheep;* our wool-growers have learned this, and are practicing the more profitable method of early and continuous feeding." Another observes: "Long experience has convinced me that little or no disease ever troubles a lot of *fat* sheep." The principal exceptions to the generally favorable condition of sheep through the past winter are found in the Gulf States, North Carolina, Tennessee, Kentucky, and West Virginia. The reasons for these exceptions will be apparent in the extracts from correspondents which follow. Out of 915 counties reporting with such a degree of definiteness as to give some clew to their relative condition,

520 are returned as above average, 235 as average, and 160 as below average. Out of 40 returns from New England 33 range above average and only 2 below—namely, Franklin, Maine, and Cheshire, New Hampshire; in the latter the condition is reported "not good, owing to poor hay from wet weather." Grafton, the same State, returns "first rate," and Hillsborough, "never better." The report from Orange, Vermont, "looking well, no sudden changes, winter cold and dry," is a specimen for the State. Bristol, Massachusetts, returns "25 per cent. above average;" Kent, "extra good;" New London, Connecticut, "much better than ordinary." The relative condition in the other States and the Territories will be evident from the following table of condition in counties and from the extracts beneath. As in the table for cattle, counties in which the returns were not sufficiently definite to admit of classification are omitted:

States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.	States and Territories.	Number of counties definitely reported.	Above average.	Average.	Below average.
Maine	10	9	1	.....	West Virginia	29	8	10	1
New Hampshire	6	5	.....	1	Kentucky	41	15	12	14
Vermont	10	8	1	1	Missouri	51	30	13	8
Massachusetts	7	5	2	.....	Illinois	49	36	11	2
Rhode Island	2	2	.....	.....	Indiana	51	35	10	6
Connecticut	5	4	1	.....	Ohio	42	28	10	4
New York	34	17	13	4	Michigan	26	18	6	2
New Jersey	11	11	.....	.....	Wisconsin	29	23	4	6
Pennsylvania	33	23	9	1	Minnesota	30	19	7	4
Delaware	1	.....	.....	1	Iowa	51	40	10	1
Maryland	9	2	5	2	Kansas	17	17	.....	.....
Virginia	57	26	22	9	Nebraska	10	7	3	.....
North Carolina	44	15	17	12	California	17	14	1	2
South Carolina	7	2	2	3	Oregon	6	6	.....	.....
Georgia	34	14	9	11	Nevada	1	1	.....	.....
Florida	11	5	5	1	Colorado Territory	5	5	.....	.....
Alabama	22	9	9	6	Dakota Territory	4	3	1	.....
Mississippi	22	8	6	8	Montana Territory	2	2	.....	.....
Louisiana	13	7	1	5	Washington Territory	1	1	.....	.....
Texas	44	17	13	14	Utah Territory	9	3	2	4
Arkansas	18	6	9	3	New Mexico Territory	1	.....	1	.....
Tennessee	38	12	9	17	Idaho Territory	1	1	.....	.....

NEW YORK.—*Chemung:* Good; less hay and more grain. *Washington:* Thin; light fleeces; long, hard winter.

NEW JERSEY.—*Warren:* Look better than for many years.

PENNSYLVANIA.—*Cumberland:* Better than for many years. *Bucks:* Very good; less hay and more grain. *Indiana:* Have done well. The yield of lambs is wonderful, but a hard spring for raising them. *Union:* Poor.

DELAWARE.—*Sussex:* Ten per cent. below average.

MARYLAND.—*Queen Anne:* Looking very well; specially cared for.

VIRGINIA.—*Madison:* Good; the result of increased attention. *Grayson:* Have wintered better than usual, owing to considerable progress in the improvement of breeds; there is a marked contrast between the improvement of flocks now and one or two years ago. *Fauquier:* Have suffered more than other stock, but where properly sheltered and cared for but few losses. *Botetourt:* Have been injured by the dreadful cold. *Greenville:* Good; with a run on pasture all winter.

NORTH CAROLINA.—*Tyrrel:* Strong and healthy. *Chowan:* Bad, owing to the extreme cold and wet winter.

SOUTH CAROLINA.—*Lexington:* Rather poor; where properly sheltered and fed they look well.

GEORGIA.—*Wilkes:* Better than usual because better cared for. *Dooly:* Splendid; never known to be better. *Laurens:* Reduced; winter unprecedentedly cold. *Cobb:* Have suffered for food and shelter. *White:* Poor; cold, wet, and no shelter. *Liberty:* All not killed by dogs remarkably good. *Milton:* Average, what few the dogs have left. *Jackson:* All killed by dogs. *Oglethorpe:* My flock is small, but they are healthy and fat. I do not lose any, but take the precaution to shoot every dog I find among them. After notice of this I hardly ever see a dog, that the owner cares anything

about, in their pasture. *McDuffie:* Very bad; a great many of the sheep are unable to raise their young, from the fact that they are too poor to give nourishment enough to sustain life. We have lost twice as many as in any previous winter within my recollection.

FLORIDA.—*Gadsden:* Better than cattle, more attention being paid to feeding and sheltering them. *Jackson:* Average; long, severe winter, but dryer than usual. *Liberty:* Better than for ten years.

ALABAMA.—*Limestone:* Very poor; winter the severest ever known. About one-third of the early lambs died. *Butler:* Average; never go into winter-quarters. *Marshall:* Good; subsist through the winter without feed.

MISSISSIPPI.—*Jones:* Those attended to very good. *Attala:* Never worse, owing to bad winter and lack of feed.

LOUISIANA.—*Tensas:* Good; will take care of themselves all winter and get fat. *Morehouse:* Bad; a large majority of the lambs have died. *West Feliciana:* Poor and bad; no attention paid to feeding in winter. *East Feliciana:* Good, so far as cared for. *Richland:* Many have died from exposure and insufficient food.

TEXAS.—*Barnet:* Lean; those fed with corn on stormy days looking somewhat better. *Rusk:* Very good, as they are very fond of cotton-seed, which appears to agree with them. *Medina:* Suffered less than cattle, as very short grass and even weeds will sustain them. *Navarro:* Better than cattle, but not more than half the lambs have been saved. *Williamson:* Poor, owing to the scab; much of the wool shed. *Kendall:* Thin, as no winter-quarters are provided.

ARKANSAS.—*Independence:* Better cared for than other stock, and though looking badly but few have been allowed to perish. *Jefferson:* Have done well without shelter—much better than cattle. *Izard:* Poor, for want of food and shelter.

TENNESSEE.—*Sumner:* Better than usual, owing to better attention. *Gibson:* Well, thrifty, and strong; less than usual of thawing and freezing, and of cold drizzling rains. *Wayne:* Above average; better cared for than usual. *Robertson:* Low; dry fall, long winter, and without shelter or grain-food. *Bedford:* Looking badly; many have died where flocks are large. *Granger:* Have not come out, for the reason that we raise dogs and not sheep.

WEST VIRGINIA.—*Upshur:* Average; those that were grained look remarkably well. *Fayette:* Look bad; a long severe winter with a good deal of snow and rain has made it very hard on sheep. *Boone:* Not as good as usual; great loss of lambs. *Marshall:* Worse than for many years. *Hancock:* Very good.

KENTUCKY.—*Trimble:* The well provided for and sheltered look well; those not sheltered and cared for are poor. *Nicholas:* Better than cattle, owing to the fact that there has not been much rain. *Rockcastle:* Rather bad; severe winter and not much shelter. *Carroll:* Below average; have required more care and food than usual, owing to the sleet that covered the grass entirely for several weeks. Generally, in this county, the sheep live on the blue grass the whole winter without other food. *Graves:* Doing well, what have escaped the dogs; four dogs to one sheep.

MISSOURI.—*Adair:* Better than usual. Farmers are taking better care of their sheep than heretofore. *Shelby:* Doing well; winter cold but dry. *Pemiscot:* Average; the few we keep have been housed. *Lawrence:* Poor; too cold for them without shelter. *Vernon:* Poor and very ragged, owing to the scab.

ILLINOIS.—*Grundy:* Better than average, on account of the plenty and cheapness of corn and oats, and the value of wool. *DeKalb:* Have wintered well; better provided with winter-quarters than formerly. *Franklin:* Better than usual; dry weather and good care. *Pike:* Good; abundant corn crop.

INDIANA.—*Carroll:* Good, where their quarters were good. *Scott:* Better than usual; better cared for. *Wayne:* Looking well; have unusual attention when the price is high. *Warrick:* Good; received more than ordinary attention. *Morgan:* Ten per cent. below average; the winter extremely severe, the hardest I have seen in forty-six years. *Carroll:* Good, where their quarters were good.

OHIO.—*Logan:* Generally good; cases of neglect of care and feeding the exceptions. *Champaign:* Average; where properly fed, above; cold dry weather does not affect well-fed sheep unfavorably. *Hardin:* Quite a loss of old and feeble sheep and of lambs. *Loraine:* Fine, where well attended to.

MICHIGAN.—*Branch:* Never better. *Lapeer:* Fifteen per cent. above average. *Montcalm:* Hardly average; snow fell about the 1st of December, ground covered ever since, and weather extremely cold.

WISCONSIN.—*Outagamie:* Look finely; always do well when wool brings a good price. *Monroe:* Good, except where scab prevailed. *Fond du Lac:* Some loss for want of care and shelter. *Walworth:* Fair to good. The clear dry atmosphere has been conducive to full health and good appetite. Sheep have done unusually well; have consumed much coarse feed, and promise a good clip of wool and crop of lambs.

MINNESOTA.—*Carver:* Never better; winter cold, but dry. *Sibley:* Not good; the farmers are not yet prepared with sufficient barns.

IOWA.—*Polk:* Looking well. Long experience has convinced me that little or no

disease ever troubles a lot of *fat* sheep. *Tama:* Good. Corn abundant. *Cherokee:* Above average; better care. *Guthrie:* Above average. Cheap corn.

KANSAS.—All above average. *Labette:* Better than ever known in this county. *Woodson:* Much better than usual. *Wool will not grow on poor and poorly fed sheep.* Our wool-growers have learned this, and are practicing the more profitable method of early and continuous feeding.

NEBRASKA.—*Madison:* Plenty good enough for mutton.

CALIFORNIA.—*Alameda:* Good. The increase of lambs will be 80 per cent. throughout the State. *Mendocino:* Better than ever before. *Del Norte:* Have no winter-quarters; run in the open field and are fat. *Stanislaus:* Poor, from want of food and shelter from the cold winds and storms. *San Diego:* Suffered, and 20 to 25 per cent. of all flocks died for want of pasture. No rains to do any good until February, there having been a drought for the last three years. *Plumas:* Of 30,000 sheep in this county in the summer, not more than 1,000 are wintered here, the rest being driven to the lower valleys for winter-grazing.

OREGON.—*Yam Hill:* Excellent; much better than usual. *Umatilla:* Fine; have passed the winter without feed.

NEVADA.—*Esmeralda:* Very good.

COLORADO.—*Conejos:* Good; herded, but never fed.

DAKOTA.—*Minnehaha:* Fine. Cold, but equable winter.

UTAH.—*Sevier:* Excellent. Pasturage excellent. *Tooele:* Poor and scabby.

IDAHO.—*Ada:* Better than average.

MONTANA.—*Lewis and Clarke:* Much better than usual. Winter open and mild. *Missoula:* Good.

NEW MEXICO.—*Santa Fé:* Fair.

WASHINGTON.—*King:* Good.

LOSSES OF CATTLE AND SHEEP.

In the following table, counties reporting "no loss," without referring to the previous winter, are placed under the head "less;" under the head "average" are placed all reported as "average," or in terms equivalent, whether with or without reference to the previous winter.

States and Territories.	No. of counties reported.	Less.	Average.	Greater.	States and Territories.	No. of counties reported.	Less.	Average.	Greater.
Maine	10	10	0	0	West Virginia	29	10	12	7
New Hampshire	7	5	2	0	Kentucky	39	12	22	5
Vermont	10	5	3	2	Missouri	53	27	23	3
Massachusetts	6	6	0	0	Illinois	48	25	19	4
Rhode Island	2	2	0	0	Indiana	51	24	23	4
Connecticut	7	4	3	0	Ohio	43	17	19	7
New York	36	17	17	2	Michigan	27	17	8	2
New Jersey	13	7	6	0	Wisconsin	29	16	11	2
Pennsylvania	40	29	10	1	Minnesota	30	11	6	13
Delaware	1	0	1	0	Iowa	58	32	19	7
Maryland	11	7	1	3	Kansas	32	28	2	2
Virginia	61	32	18	11	Nebraska	11	7	3	1
North Carolina	45	25	14	6	California	20	13	7	0
South Carolina	10	5	2	3	Oregon	6	5	1	0
Georgia	47	23	13	11	Nevada	1	1	0	0
Florida	15	9	3	3	Colorado Territory	5	0	0	0
Alabama	20	4	9	7	Idaho Territory	1	1	0	0
Mississippi	28	10	10	8	Dakota Territory	5	4	1	0
Louisiana	14	7	0	7	Montana Territory	2	2	0	0
Texas	51	8	10	33	Washington Territory	1	1	0	0
Arkansas	20	9	3	8	Utah Territory	9	3	2	4
Tennessee	40	16	12	12	New Mexico Territory	1	1	0	0

Of the above 995 counties, 178 return a loss greater than in the previous winter; 315 average, and 502 less. Grand Isle and Addison Counties in Vermont are the only ones out of 42 in New England which return a greater loss. The former reports: "No loss of cattle; loss of sheep double." The latter: "Loss of cattle, average; of sheep, double." In Pennsylvania, Indiana County reports: "Less loss than

for the last ten years." *Warren:* "Our farmers are learning that it pays to feed and care for their cattle and sheep, and that it does *not* pay to get their stock nearly or quite through the winter, and then let them die." *Tioga:* Thirty per cent. less. In Cecil, Maryland, "more lambs have died, owing to the unusually severe weather."

VIRGINIA.—*Louisa:* Greater by 25 per cent. *Frederick:* In sheep, five times greater; in cattle, no greater. *James City:* Not one-fourth as great. *Northampton:* Fifteen per cent. less. *Nansemond:* Twenty per cent. greater. *Buckingham:* Less than for many years. *Clarke:* Little loss in cattle; loss of sheep much greater, fully five to one. *Henry:* Less by one-half. *Page:* Fifty per cent. less.

NORTH CAROLINA.—*Cumberland:* Less by 50 per cent. *Moore:* One-tenth of what it was last year. *Chowan:* Twenty per cent. greater. *Cherokee:* Of cattle, about double; of sheep, average. *Stanly:* Less than for several years. *Yadkin:* Less than usual; winter-feed more plenty.

GEORGIA.—*Jackson:* Very few losses of cattle; sheep all dead from dogs. *Brooks:* Ninety per cent. less than usual. *Murray:* Of cattle, 10 per cent. less; of sheep, 20 per cent. less. *McDuffee:* Twice as great. *Pulaski:* Twenty per cent. less. *Johnson:* Fifteen per cent. less. *Heard:* Twenty per cent. greater. *White, Laurens,* and *Butler:* Ten per cent. greater.

FLORIDA.—*Madison:* Average; winter more severe than the previous, but farmers are becoming more careful of their cattle. *Hamilton:* Ninety per cent. less. *Clay:* Thirty per cent. less. *Suwannee:* No loss; 35 per cent. less. *Wakulla:* Twenty per cent. less.

ALABAMA.—*Lauderdale:* Nearly double. *Blount:* Twenty-five per cent. greater. *Marshall:* Of cattle, 450 per cent. greater; of sheep, average.

MISSISSIPPI.—*Lowndes:* Losses heavy, owing to scarcity of hay and cold weather. *Wilkinson:* Of cattle, five times as great; of sheep, about the same. *Rankin:* Twenty-five per cent. greater. *Madison:* Twenty per cent. greater. *Newton:* Less by 50 per cent. *Wayne:* Fifty per cent. less. *Kemper:* Average; more attention given them.

LOUISIANA.—*Morehouse:* Twenty-five per cent. greater. *Richland:* Twenty per cent. greater. *Franklin:* Of cattle, five times as great; of sheep, two and a half times. *Tangipahoa:* Of cattle, 15 per cent. greater; of sheep, 25 per cent. greater. *Cameron, Avoyelles,* and *Saint Mary's:* No losses. *West Feliciana:* No losses except the old or very young.

TEXAS.—*Cherokee:* Of cattle, 10 per cent. less; of sheep, 50 per cent. greater. *Burnet:* Of cattle, 35 per cent. greater; of sheep, average. *Collin:* Fifty per cent. greater. *Fort Bend:* Twenty per cent. greater. *Grimes:* Thirty-three per cent. above average. *Bandera:* Loss of cattle immense; no serious loss of sheep. *Smith:* Twenty-five per cent. greater. *Atascosa:* Of cattle, about one-third this winter; scarcely any last; of sheep, about average. *Fayette:* Of cattle, by starvation, about one-third greater. *Lavaca:* One hundred per cent. greater. *Cooke:* Of cattle, ten to one; of sheep, average. *Montgomery:* Of cattle, twenty per cent. greater; of sheep, none. *Blanco:* Three or four times as great as common. *Palo Pinto:* Seventy-five per cent. less. *Comal:* Of cattle, much greater; of sheep, less. *Gonzales:* Of sheep, decidedly less; of cattle, at least 100 per cent. more. In fact, such has been the destruction of cattle by the severity of the past winter that the business of stock-raising on the old ranchero system may almost be considered a thing of the past. It is not by any means extravagant to set down the loss of cattle in Gonzales County at 20,000 head. This great loss is to be accounted for by the fact that the county has been overstocked until the grass has been destroyed, or at least so reduced as to be too short to support the cattle. This immense loss has induced many to drive even their stock-cattle in search of a market, so that the decrease of cattle from death and sale may safely be put down at 75 per cent. *Hunt:* Loss of cattle at least 30 per cent. greater than the previous year, owing to the unusual severity of the winter, added to the fact that, by reason of the drought of last year, they did not go into winter-quarters in as good condition as usual. The losses in sheep of the ordinary breeds are too slight to be estimated; the losses in the better breeds are much heavier. The latter require more attention in wintering. *Bosque:* Much greater than ever known in this county. From the best information I can get, at least one-half of all the stock-cattle have died; not from any disease, but for want of water and grass. They are in many places still suffering for water; the drought has continued so long that it has all dried up in the small tributaries, and in many places the cattle are compelled to feed five to six miles from water, all the grass having been eaten within that distance. *Dallas:* Of cattle, at least 25 per cent. greater than it ever has been.

ARKANSAS.—*Madison:* Less by 50 per cent. *Sharp:* Much less. *Hot Spring:* Heavier than for the last ten years. *Perry:* Of cattle, three to one; of sheep, average. *Montgomery:* At least three times as large. *Independence:* Ten per cent. of the cattle and hogs have perished, (for want of food and shelter.)

TENNESSEE.—*Maury:* Much greater than any winter since 1865. Half the lambs dropped at this time have died, and 75 per cent. of the ewes have lambed. *Williamson:* Ten to one. *Sumner:* Of cattle, average; of sheep, double; one-third of the lambs have died. *Macon:* Of cattle, average; of sheep, twice as great. *Roane* and *Fayette:* No losses. *Fentress:* Losses trifling. *Wayne:* Fifty per cent. less. *Monroe:* Less—very small. *Henry:* Of cattle, average; of sheep, 70 per cent.—killed by dogs.

WEST VIRGINIA.—*Morgan:* Fifty per cent. greater. *Mercer:* Of cattle, 40 per cent. less; of sheep, 20 per cent. less. *Jefferson:* Of cattle, 10 per cent. greater; of sheep, 12 per cent. greater. *Harrison:* Of cattle, average; of sheep, double. *Pleasants:* No losses this year or last.

KENTUCKY.—*Anderson:* 75 per cent. greater. *Grayson:* 90 per cent. less. *Magoffin:* 15 per cent. less. *Groves:* 5 per cent. less; the winter the coldest for twenty years, but dry. *Larue:* Of sheep three times as great.

MISSOURI.—*Marion:* Less; feed abundant, and dry winter. *Ballinger:* 50 per cent. less. *Shelby:* Less than for many years. *Linn:* 20 per cent. less, owing to the great abundance of all kinds of feed. *Pemiscot:* Of cattle, average; of sheep, less, because of the dry winter. *Vernon:* 5 per cent. greater, partly owing to excessive cold and want of water. *Carter:* No losses. *Phelps* and *Pulaski:* 25 per cent. greater. *Greene:* 25 per cent. less.

ILLINOIS.—*De Kalb:* Less than ever known. *Bureau:* 50 per cent. less. *Hancock:* Less, owing to the dry weather. *Putnam:* Less than for many winters past. *Moultrie:* Less than in any winter for ten years. *Monroe, De Witt,* and *Schuyler:* No losses. *Carroll:* Greater than usual: have suffered for water. *Kankakee:* 25 per cent. greater. *Lawrence:* 33 per cent. greater. *Macon:* 33 per cent. less.

INDIANA.—*Warren:* Less than in former years. *Ripley:* Less than in any previous year known.

OHIO.—*Vinton:* 20 per cent. less. *Adams:* 25 per cent. less. *Lorain:* Never less. *Noble:* Not so great as in other years. *Carroll:* 30 per cent. greater. *Fayette:* 20 per cent. greater.

MICHIGAN.—*Calhoun:* Less than in more open winters. *Saint Clair:* 50 per cent. less. *Montcalm:* Of cattle, very few; more sheep than in any winter within five years; think it is because they could not get to the ground.

WISCONSIN.—*Walworth:* Of cattle, 50 per cent. less; of sheep, 100 per cent. less. *Douglas, Washington, Green, Marathon,* and *Outagamie:* No losses. *Brown:* 10 per cent. greater.

MINNESOTA.—*Wascca:* More than double. *Dodge* and *Freeborn:* 100 per cent. greater. *Nicollet:* A little greater, owing to the storm of January 7. *Martin:* Of cattle, average; about one-tenth of the sheep were smothered in the great storm in January. *Watonwan:* A slight loss by the great storm of January 7. *Isanti:* 10 per cent. greater, owing to hard storms. *Brown:* Four times as many as in previous winters lost in the snow-storm. *McLeod:* Less than average, except the few that perished in the storm of January 7 and 8. *Carver:* 90 per cent. less. *Steele:* Hardly a case of loss in either.

IOWA.—*Buchanan:* Greater, owing to extreme cold, severe storms, and want of shelter; where well sheltered I hear of no loss. *Buena Vista:* A large number of cattle have been lost by being caught in corn-fields in hard storms. *Marion:* 75 per cent. less. *Floyd:* Of cattle, more, as some were buried in the snow. *Howard:* Of cattle, greater; quite a number perished in the great storm of January. *Jasper:* 20 per cent. less. *Harrison:* Almost no loss. *Audubon, Lee, Appanoose, Dallas,* and *Jackson:* No losses. *Allamakee:* 20 per cent. greater.

KANSAS.—*McPherson:* Losses, 25 per cent. last year, 2 per cent. this. *Nemeha:* No loss, better feed, better shelter, and better care the reasons. *Riley:* Less than usual; corn low, and more of it fed. *Linn:* 50 per cent. less. *Lincoln:* Last winter 33 per cent. of the cattle died and about 3 per cent. of the sheep; this year no cattle, and not half of one per cent. of sheep. *Jefferson:* 50 per cent. less. *Labette:* 60 per cent. less. *Marion:* Not 1 to 10 of last winter. *Woodson:* Of cattle, 60 per cent. less; of sheep, 40 per cent. less; early dropped lambs (which ought to be avoided) constitute the principal loss of this spring. *Lyon:* 75 per cent. less. *Rice, Chase,* and *Dickinson:* 90 per cent. less. *Sawnee:* 50 per cent. greater, owing to the severe winter and to bad management.

NEBRASKA.—*Madison:* No losses except where caught in severe wind and snow-storms. *Cedar:* 90 per cent. less. *Otoe:* 100 per cent. greater.

CALIFORNIA.—*Sacramento:* Less than in any previous winter. *Los Angelos:* Less than for several years. *Mendocino:* 70 per cent. less. *Del Norte:* 75 per cent. less. *Sonoma:* 80 per cent. less. *Butte:* 50 per cent. less. *Placer* and *Almeda:* No losses. *Contra Costa:* No losses; range abundant and winter mild.

NEVADA.—*Esmeralda:* Very favorably.

OREGON.—*Grant:* 25 per cent. less; *Yam Hill:* 90 per cent. less.

COLORADO TERRITORY.—*Weld:* 95 per cent. less. *Conejos, Huerfano,* and *Douglas:* No losses.

DAKOTA.—*Lincoln:* No losses.

UTAH.—*Tooele:* 100 per cent. greater; all the early lambs died, also most of the oldest ewes; the cattle did not fare better; several made high wages by skinning dead cattle on the range. *San Pete* and *Davis:* 10 per cent. greater. *Weber:* Less. *Rich:* Very favorably; but few losses.
MONTANA.—*Lewis and Clarke:* No losses.
IDAHO.—*Ada:* Losses merely nominal.
WASHINGTON.—*King:* Hardly any loss.
NEW MEXICO.—*Santa Fé:* Little or no loss.

DISEASES OF FARM ANIMALS.

With the exception of the epizootic influenza, popularly known as the epizooty, which affected horses during the year past, farm animals of all kinds enjoyed a remarkable immunity from disease during 1872. The experience of former years was fruitful in many localities in the increased care and better provision for the wants of live stock, yet in many portions of our country much of this practical humanity is yet to be learned. A very large proportion of the few diseases of cattle, sheep, and hogs reported by our correspondents is attributed to lack of shelter, food, and cleanliness, while the loss of horses was considerably enhanced by neglect or ill-treatment, especially in compelling animals to perform labor while in a debilitated condition. Below will be found a brief generalization of the important facts in regard to each class of farm animals, as detailed by our correspondents.

DISEASES OF HORSES.

With the exception of the sudden and severe eruption of epizootic influenza, which swept across the Union during the last fall and winter, the last pulsations of which are now felt upon the Pacific coast, horses, during 1872, were remarkably exempt from disease. This prevailing malady, commonly called the epizooty, seems to have absorbed all ordinary horse ailments. A few counties rather dubiously report other diseases, but it is difficult to ascertain how far these were modifications or results of the epizooty. The latter, with its various developments, constitutes almost exclusively the record of horse diseases in the United States during 1872. It first attracted general notice, through the newspapers, about the last of September, and was represented as having invaded the United States from Canada, where it had prevailed for some time previous. Our reports, however, show an earlier date of attack at isolated points in this country. The earliest visitation—about the last of August—appears to have been in Mercer County, on the western border of Pennsylvania, the third county in southward succession from Lake Erie. It appeared a little later—September 1—in Hillsborough and Merrimack, two of the most southern counties of New Hampshire. Our correspondent in Forsythe, one of the mountainous counties of North Carolina, assigns September 5 as the date of its outbreak in that locality. About the middle of September it was noticed simultaneously in Cape May and Hunterdon Counties, New Jersey; Northampton and McKean Counties, Pennsylvania; Cecil and Talbot Counties on the eastern shore of Maryland; Madison, Greenville, Rappahannock and Prince George Counties, Virginia; Moultrie County, Illinois; Breckinridge County, Kentucky, and Mineral County, West Virginia. Cape May is the most southerly county in New Jersey; it is remarkable, in this connection, that the disease was not noticed in At-

lantic, the next county to the north, till December 1. Its general progress was southward and westward, yet not without some perplexing anomalies. In Ohio, for instance, it appeared about October 1; in Geauga, in the extreme northeast, and in Hamilton, in the extreme southwest, while in the majority of the counties of the State its advent is reported as late in November, and in one—Williams, in the extreme Northwest—so late as December 20. In the other States north of the Ohio River, its first symptoms were variously noted from the middle of October till Christmas. West of the Mississippi it appeared to radiate about equally in different directions. At our latest advices it had just appeared in Lewis and Clarke County, Montana, and in Ada County, Idaho; in both localities its introduction was charged upon overland stage companies. It appeared in El Paso County, Colorado, as early as December 1; but Conejos, Huerfano, Douglas, and Weld report its appearance in the earlier part of January. Still later it appeared in Santa Fé County, New Mexico, and in Sevier, Weber, Tooele, Rich, San Pete, Cache, and Davis Counties, Utah. Its presence was felt in Plumas County, California, as early as December 1; in Alameda, December 15; Santa Clara, January 31; San Joaquin, February 14; Alpine, March 5; Los Angelos, March 18. It was expected in other counties in California, Oregon, and Washington, but in the latter it had not appeared.

The average dates of the first appearance of the disease in each of the States were as follows: Maine, October 19; New Hampshire, October 20; Vermont, October 18; Massachusetts, November 7; Rhode Island, November 1; Connecticut, October 29; New York, October 19; New Jersey, October 20; Pennsylvania, October 24; Delaware, October 28; Maryland, October 22; Virginia, November 5; North Carolina, November 17; South Carolina, November 19; Georgia, November 23; Florida, November 17; Alabama, December 1; Mississippi, November 28; Louisiania, December 5; Texas, December 17; Arkansas, November 19; Tennessee, November 21; West Virginia, November 19; Kentucky, November 18; Ohio, November 9; Michigan, November 2; Indiana, November 19; Illinois, November 17; Wisconsin, November 15; Minnesota, December 3; Iowa, November 28; Missouri, December 7; Kansas, December 10; Nebraska, December 14.

The symptoms of the disease are detailed with remarkable uniformity in different parts of the country. It is everywhere described as a catarrhal influenza; in many places it so closely resembles the old fashioned "distemper" that, but for the special attention given to the subject, it would have been identified with it. That it is to some extent contagious seems scarcely to admit of doubt, but this character of the malady will by no means account for its regular and rapid extension over the country. It traveled in radial lines from its original points of development in the New England and Middle States, and within ten weeks was demonstrating its existence in Texas and California. Its local diffusion was accompanied by phenomena which cannot be accounted for upon the hypothesis of contagion. Its appearance at points in advance of its regular line of progress, and its simultaneous development in all parts of a county, argue the existence of some general conditions, some predisposing causes of disease, developing themselves in succession like waves across the continent. In New York City 40,000 horses were attacked within a week or ten days, and in all the cities, towns, and rural districts, the visitation was so sudden and so general as to paralyze all kinds of transportation which depended upon the use of horses. Occasionally horses would escape the disease, though confined in stables with infected

animals. On the other hand, animals kept from all possible contagion were affected as strongly as others.

The premonitory symptoms of the disease were, generally, a loss of appetite, apathetic dullness, prostration, drooping head and ears, a staring coat of hair, watery or glassy eyes, and a thin discharge of mucus from the nose. As the disease advanced these symptoms were intensified. The joints became stiff, and a peculiar cough, sometimes described as sharp and hacking, and sometimes as deep in the chest, seemed to rack the whole animal system. Muscular exertions would sometimes excite this cough to distressing paroxysms. Fever set in, and the blood circulated with abnormal activity in the head, neck, and body, while it almost deserted the ears and legs, leaving them unnaturally cold. The mouth was hot, and the nasal membranes, in some cases, were congested. The nasal discharge became more copious and offensive, varying in color from white to green, and often stained with blood. The animal obtained great relief from the free discharge of this purulent matter. The lungs and throat sympathized with the other organs, and showed signs of acute inflammation. The breath was labored and painful. In more severe cases the brain was affected, a symptom which generally indicated a fatal termination.

The average continuance of the disease in individual cases varied considerably, the extreme range being between five days and forty-five days, the minimum being in Franklin County, North Carolina. The averages were somewhat greater east of the Alleghany Mountains. In Maine, the county averages ranged from 10 to 25 days, the State average being 16. New Hampshire reports a longer continuance of the disease, the counties ranging from 21 to 42 days, and the State averaging 35. In the other New England States the period was shorter; Vermont averaging 20; Massachusetts, 20; Connecticut, 23. In the Middle States the county averages ranged from 9 to 42 days, the shortest period being reported in Cattaraugus, New York. The State of New York averaged 20 days; New Jersey, 25; Pennsylvania, 23. The Atlantic Coast States varied between five days (in Franklin County, North Carolina) and 42 days. The State averages were as follows: Maryland, 26 days; Virginia, 21; North Carolina, 21; South Carolina, 26; Georgia, 21. The Gulf States varied between 8 days and 42 days, the shorter period being reported in Lauderdale and Limestone Counties, Alabama. Florida averaged 19 days; Alabama, 20; Mississippi, 21; Louisiana, 22; Texas, 21. The inland Southern States ranged from 10 to 45 days, the minimum being in Pocahontas County, West Virginia, and the maximum in Davies County, Kentucky. Arkansas averaged 19 days; Tennessee, 21; West Virginia, 18; Kentucky, 20. North of the Ohio River the county averages ranged from 10 to 42 days. Ohio averaged 20 days; Michigan, 23; Indiana, 23; Illinois, 23; Wisconsin, 22. West of the Mississippi the disease prevailed from 10 to 35 days; Minnesota averaged 24 days; Iowa, 23; Missouri, 19; Kansas, 21; Nebraska, 22. The reports from the Territories were too few for a reliable average. In California one county, San Joaquin, averaged 12 days.

As a general thing the severity of the visitation in different localities may be estimated from the length of its continuance. This rule, however, is not without exceptions, and should be applied with due caution. The period was often unnecessarily lengthened by abuse, neglect, or hard work before final recovery. This ill treatment not only protracted the preliminary attack, but also brought on relapses, which terminated in dropsy, pneumonia, or other forms of acute disease, from which few

animals recovered, and those that did survive were generally of little value as work-animals subsequently.

The treatment of disordered animals was of the most varied description, from the most systematic quackery to utter neglect. It is difficult to decide from our reports which of these extremes was the more fatal. Some ambitious veterinary surgeons exhausted the resources of the materia medica in order to find a universal specific, and mercilessly administered nostrum after nostrum, to the great injury of the afflicted animal. Liverymen in towns and cities were especially addicted to elaborate treatment. The suddenness of the visitation, and the very serious impediment which it created in all kinds of industry and trade, begot an anxiety to expedite the processes of nature and to work a cure in the shortest possible time. This impatience caused the loss of a large number of valuable horses that might otherwise have entirely recovered from the disease; it was generally the more valuable animals that were subjected to this forcing treatment. In a large number of counties, in all parts of the Union, these facts are clearly and emphatically stated by our correspondents, who almost universally favor a milder and more sensible treatment. The application of embrocation to the skin in order to bring the internal inflammation to the surface and thus relieve the suffering organs, and the cleansing of the nostrils by dilutions of carbolic acid, &c., and stimulating the free discharge of mucus, were in many cases reported as very beneficial, but the unmitigated dosing practiced by many persons is strongly condemned. The elements of the most successful treatment appear to have been rest, extra care, good grooming, clean, warm, and well-ventilated stables, from which poisonous effluvia had been removed by lime, carbolic acid, or other disinfectants, a genial and yet laxative diet of scalded oats, warm bran mash, raw apples, and potatoes, &c., blankets and leg-bandages. In many cases gentle exercise or even moderate labor was reported as better than absolute rest, but this could have been true only in milder cases, and in the prior stages of the disease. In some portions of the country where the infliction was not severe, good shelter, with free range of dry pasture in good weather, was found better than blanketing and warm stables. In a few cases, animals entirely destitute of shelter, fared better than others kept under cover. Such, however, could not have been exposed to the cold winter rains so injurious to even healthy farm animals in most parts of the country. A case in point occurred near Richmond, Virginia; ten mules were employed in a coal-mine and had no communication with the upper air except through a shaft 600 feet deep. One of the mules commenced coughing on Saturday night, and by Tuesday all were affected with the epizooty. Two died, but the others were but mildly affected. The two that died were occasionally wet from passing under a drip during their work, while the others were not thus exposed.

The fatality was small considering the large number of animals affected by the disease. In Maine five counties report losses ranging from 1 to 6 per cent. of the animals attacked; five others report a few cases. In New Hampshire, Vermont, and Connecticut, no county lost over 2½ per cent. In Massachusetts and Rhode Island the loss in one county of each reached 10 per cent. The maximum in New York and New Jersey was 5 per cent.; in Pennsylvania, 3 per cent.; in Maryland, 3 per cent.; Virginia, 6½ per cent.; North Carolina, 1 per cent.; South Carolina, 2 per cent.; Georgia, 5 per cent.; Florida, 3 per cent.; Alabama, 2 per cent.; Mississippi, 5 per cent.; Louisiana, 2 per cent.; Texas, 15 per cent, (in Kaufman County;) Arkansas, 5 per cent.; Ten-

nessee, 4 per cent.; West Virginia, 5 per cent.; Kentucky, 4 per cent.; Ohio, 5 per cent.; Michigan, 2 per cent.; Indiana, 2 per cent.; Illinois, 5 per cent.; Wisconsin, 1 per cent.; Minnesota, 2½ per cent.; Iowa, 3 per cent.; Missouri, 1 per cent.; Kansas, 1 per cent.; Nebraska, 1 per cent. The higher maxima, however, generally indicate isolated cases. In West Virginia, for instance, most of the counties reported 1 per cent. or less, while in several there were no deaths. One county in Florida (Volusia) reports no cases.

The mortality of asses and mules was especially remarkable in portions of the South and West. In Navarro and Collin Counties, Texas, 50 per cent. of the jacks and jennets in the county died; in Cherokee, 20 per cent.; in Limestone the disease was very fatal. In Madison County, Arkansas, nine-tenths of asses and mules died. Tennessee reports a heavy mortality; Hamilton County, eight-fourteenths; Maury, 20 per cent.; Lincoln, 25 per cent.; Robertson, 50 per cent.; Monroe, 25 per cent.; Davidson, 67 per cent.; Sumner, 33 per cent.; Giles, 67 per cent.; Knox and Granger, all. A similar mortality of the asinine tribe is reported in Christian, Owsley, Taylor, and Lane Counties, Kentucky. One correspondent thinks that the majority of the jacks in Kentucky and Tennessee died. Hardly a jack or jennet was left in Montgomery County, Ohio. A heavy loss of this class of animals was also felt in Indiana, Illinois, and Missouri. In several counties in each of these States the losses included half the cases of disease, and in some cases half the number of animals in the county. In Shawnee County, Kansas, the only victims of the malady were jacks.

The mortality in horses was to a large extent caused by their being worked before they had entirely recovered from disease. In several counties it is expressly stated that no animals died except from overwork. Quite a number of counties report no deaths among their animals; of this class of counties there is in Massachusetts, 1; New York, 2; New Jersey, 2; Pennsylvania, 2; Maryland, 1; Virginia, 13; North Carolina, 17; South Carolina, 2; Georgia, 15; Florida, 2; Alabama, 5; Mississippi, 8; Louisiana, 4; Texas, 7; Arkansas, 3; Tennessee, 10; West Virginia, 6; Kentucky, 7; Ohio, 8; Michigan, 2; Indiana, 12; Illinois, 5; Wisconsin, 6; Minnesota, 5; Iowa, 5; Missouri, 10; Kansas, 6; Nebraska, 4.

The condition of animals after recovery, or at least after the removal of active symptoms of the disease, was quite various. In some counties it is reported that the general health and spirit of the affected animals were greatly improved, a result attributed to rest, good food, and extra care expended upon them. In other cases they were found to be fully up to their former *status* of flesh and strength. In others, however, a deterioration was observed, which it was feared would, in some animals, prove permanent. In many counties this deterioration is ascribed to neglect, hard usage, and premature working, but in others it cannot thus be accounted for.

DISEASES OF CATTLE.

Cattle appear to have been unusually healthy during 1872. In no county in New England, so far as reported, was there any disease prevalent to a noticeable extent. Abortion in dairy cows was prevalent in a few counties in the Middle States; the loss of calves in Montgomery County, New York, amounting to 10 per cent. In Dauphin County, Pennsylvania, cows with calf were subject to a type of influenza analogous to the epizooty among horses. This disease also appeared in Clarendon County, South Carolina, Glascock County, Georgia, and McLennan

County, Texas. In Hot Spring County, Arkansas, the symptoms were especially well marked. In Daviess County, Kentucky, a few cattle died of this malady. It appeared also in Logan County, Ohio, in St. Clair County, Illinois, and in Martin County, Minnesota. In many cases it was difficult to say how far such cases should be attributed to gross neglect and starvation.

A type of disease known in the South as the "Carolina distemper," or "murrain," prevailed in several counties of Virginia. In Lunenburgh it was regarded as an inflammation of the stomach, caused by lack of water and by eating sedge grass, which could be obviated by raising more clover and by a plentiful supply of salt and pure water. In Henry County it attacked the fattest and finest animals. In Matthews it was especially fatal among cattle imported from the North. It was violent in Halifax County, where one-third of the cattle were affected by it, and destroyed life in from one to three days. It there prevails mostly in summer and fall, and is most destructive in dry, hot seasons. In Randolph County, North Carolina, it is known as "murrain or tick disease," and is very sudden and fatal, attacking the finest animals, often cows in full milk. Diseases popularly known as murrain or distemper prevailed, to a greater or less extent, in Randolph, Stokes, Alexander, and Yadkin counties, North Carolina; in Dooly and Catoosa Counties, Georgia; in Limestone County, Alabama; in Jones County, Mississippi; in Lincoln, Wayne, Bedford, Hamilton, and Polk Counties, Tennessee; in Boone County, West Virginia; in De Kalb County, Illinois; in Caldwell County, Missouri; in Woodson County, Kansas; and in Sonoma and Del Norte Counties, California. The very diverse conditions of the animals affected, from the finest and healthiest to the poorest and most neglected, renders it very unlikely that the types of disease thus designated should be identical, or even similar.

The black leg prevailed in Grayson County, Virginia. In Pocahontas County, West Virginia, it attacked young cattle upon either an improvement or a decline in condition, resulting from deficient or abundant pasture. In Cass County, Indiana, 100 calves died of black leg, and a few cases are supposed to have occurred in Dodge County, Wisconsin. It was prevalent to some extent in Union and Monona Counties, Iowa, and quite fatal in Vernon County, Missouri, destroying 20 per cent. of the calves. In Nemaha County, Kansas, it swept 2 per cent. of the calves and 1 per cent. of the yearlings; a few fatal cases are also reported in Johnson. It was also known in Pawnee County, Nebraska, and in Douglas and El Paso Counties, Colorado.

Pleuro-pneumonia was somewhat serious around Baltimore, where the spread of the disease was far more effectually arrested by removing diseased animals than by medicines. Lung diseases of ordinary types affected dairy-cows in Kings County, New York, but farm-cattle were exempt. The hollow-horn, which one of our correspondents styles a synonym for low feeding and abuse, is reported among the old cows of Baltimore County. It also prevailed to some extent in Highland County, Virginia; in Tuscaloosa County, Alabama; in Coahoma County, Mississippi; and in Boone County, West Virginia. In Laurens County, South Carolina, ill-treatment resulted in the scours, quite fatal in some places. In Taylor County, Florida, many cattle died after eating of the plentiful live-oak mast. One farmer lost 300 head of a herd of 500. In Marshall County, Alabama, a large number were poisoned by eating ivy. An unknown disease was fatal in Chesterfield County, Virginia. In Russell County, Kentucky, a singular malady, without fatal results, caused the legs and feet to swell and remain swollen for several days.

The sore mouth, in Gibson County, Indiana, yielded to a free use of alum and salt. An occasional case of peritonitis occurred in Cook County, Illinois. In Winneshiek County, Iowa, one farmer lost three head by an unknown disease characterized by aimlessly wandering through the pasture and resting against fences or trees till the muscles would give way. After three days the affected animals died. No other cases reported. The above comprise the casualties by all diseases except the Spanish or Texas fever, which is treated under a separate head.

DISEASES OF SHEEP.

A few cases of grub in the head are reported in Sagadahoc County, Maine. Foot-rot, or scab, or both, occurred in Cheshire, New Hampshire, and in Orange, Rutland, and Addison, Vermont, and considerable dysentery, especially among lambs, in Grand Isle. In Orange County the scab was due to a single Canada flock imported. The "lung worm," in Litchfield, Connecticut, closes the list of casualties in New England. In New York the foot-rot prevailed in Steuben, Oneida, Wyoming, Ontario, Erie, and Wayne, generally to a very small extent. Scab was light in Suffolk. Sore mouth and lips were reported in Washington. Foot-rot affected half the flocks in Gloucester County, New Jersey, and existed in Salem. An unknown disease destroyed 4 or 5 per cent. in Cumberland. Scab and foot-rot prevailed in Erie, Lawrence, Beaver, and Tioga Counties, Pennsylvania, and pleuro-pneumonia in Bucks; losses small. Grub in the head to some extent affected the flocks of Saint Mary's County, Maryland, while Talbot lost 5 per cent. from scab. In Virginia an unknown disease is reported as somewhat troublesome in a few counties, such as Nansemond, Page, and Prince William. In Halifax and Northumberland a malady, showing symptoms analogous to the epizooty in horses, resulted in a few deaths. In Northumberland the disease was confined to fat sheep on two farms, many of whom had been wintered in a rye-field. Foot-rot prevailed in Jackson, Yancey, and Madison Counties, North Carolina, scarcely ever affecting sheep running in the woods, but general among pastured sheep in winter. In Randolph symptoms similar to the epizooty are reported among sheep in poor condition; 40 per cent. of the lambs died. Mitchell suffered considerably from an unknown disease. Chowan lost 3 per cent. by distemper. York District, South Carolina, lost 8 per cent. by foot-rot. In Newberry one-fourth of the grown sheep and most of the lambs were lost by influenza. In Murray County, Georgia, foot-rot prevailed to a remarkable extent. Within 6 months 20 per cent. of the whole stock died, and all were more or less affected. The scours appeared in Wilkes.

The losses of sheep reported in Florida were confined to one flock in Madison County, and amounted to 3 per cent. by foot-rot. No county in Alabama reported any sheep disease. In Mississippi the foot-rot existed in Pike, Lee, and Hancock Counties; in the latter, it was confined to the coast, the hill flocks being free. A little scab appeared in Madison, and some distemper in Jones. Louisiana reports no diseases. The scab affected half the sheep of Kendall County, Texas, and destroyed one-third of the flocks of Blanco. In Navarro this malady was found only in large flocks; Collin lost 5 per cent.; Burleson, Bee, Austin, Dallas, Washington, Medina, Galveston, Bandera, and Orange, were more or less infected with sheep diseases. These losses, in most cases, were the result of neglect and starvation. Scab is reported in Benton and Hot Spring Counties, Arkansas, and, in the latter, scab; losses small. Campbell County, Tennessee, lost 1½ per cent. by rot, which

also prevailed, though to a less extent, in Hickman, Loudon, Gibson, Bedford, Meigs, Fentress, and Hancock. In Hamilton County, one farmer lost nine-tenths of his lambs by scours, which he attributed to too close breeding. In Sumner, corn-fed sheep, kept within narrow range, lost severely. Foot-rot appeared in Cabell, Mercer, Randolph, and Pocahontas Counties, West Virginia. In the last-named county, the disease was successfully treated by paring the hoof and applying deliquescent chloride of zinc. In Marion County, Kentucky, 25 per cent. died of catarrh. The scours appeared in Larue; the blind-staggers in Ohio; and a little rot in Jackson, Adair, and Owsley Counties.

In Ohio foot-rot appeared in Logan, Medina, Madison, Champaign, Erie, Wyandot, Crawford, Geauga, Delaware, Mahoning, Perry, and Lorain Counties, the loss being generally small. The scab is reported in Madison, and Stark lost 5 per cent. from grub in the head. Perry lost 2 per cent. from "paper-skin" or "pale-skin," and epizootic-influenza. The latter appeared also in Marion. In Washtenaw County, Michigan, were a few cases of foot-rot, and, in Tuscola, of pnuemonia. In Crawford County, Indiana, the grub in the head was somewhat troublesome; the catarrh in Ohio County; and sore mouth and throat in Martin. In Illinois, scab or foot-rot prevailed in a few counties, viz, Moultrie, Vermillion, Carroll, Cass, Lawrence, Wayne, Clinton, Pike, and Washington. In Lawrence the malady was general, worse than for fifteen years. In Clinton, these diseases appear to have been confined mostly to imported fine wool sheep. A decoction of tobacco was found of excellent application in scab, while foot-rot generally yielded to dry pastures and vitriol. In Walmoth County, Wisconsin, a few cases of scab and foot-rot appeared in the lowlands. In Greene, a wash of blue vitriol was found a good remedy for the latter. A few died of grub in the head in Fond du Lac, and some of epizootic-influenza in Dunn.

In Minnesota scab or foot-rot destroyed 5 per cent. in Washington County. Scab affected one-third of the sheep in Marion County, Iowa, and one-half in Madison. It also appeared in Cass, Jefferson, Union, and Wayne. In Marion 2 per cent. were affected with foot-rot. Some distemper also appeared in Iowa County. In Missouri scab is reported in Caldwell, DeKalb, Johnson, Moniteau, Newton, Ozark, Vernon, and Ralls Counties. In Vernon it affected half the sheep. In Callaway it caused a loss estimated at $800. Greene and Vernon report grub in the head. In the latter the loss amounted to 12 per cent. Iron County had some cases of murrain or dry-rot. In Linn County, Kansas, a few sheep were affected with grub in the head, and a few had the scab. The latter was developed in Chase County in an imported flock. It also appeared in Wilson and Woodson Counties, mostly in coarse wooled flocks. Some distemper is reported in Brown. Nebraska reports no sheep diseases.

In El Paso County, Colorado, scab was introduced by the importation of diseased sheep from the States, which were purchased on account of their cheapness. The disease extended to flocks previously unaffected. It also appeared in Weber, Toole, Rich, and Cache Counties, Utah. In Davis some flocks were affected to the extent of 15 per cent. with an undescribed disease; very few recovering. The marked symptoms of the malady were dullness of eyes and a peculiar shaking of the head; death usually supervened the second day. A little scab also appeared in Santa Fé County, New Mexico. A mild form of the scab was also observed in Ada County, Idaho.

On the Pacific coast the scab appeared in King County, Washington.

In Umatilla County, Oregon, half the flocks were affected by this disease, losing largely of their fleece. It also existed in Lane and Yamhill. In the latter county a few scabby sheep were imported, but the disease did not spread. In Douglas some sheep showed symptoms of poisoning, which yielded to heavy doses of Epsom salts. In California the scab prevails to a great or less extent in Contra Costa, San Diego, Stanislaus, Alameda, Mendocino, Butte, San Joaquin, Los Angeles, and Santa Barbara Counties. In Butte County the sheep is curried and sponged with a solution of blue vitriol. In some cases the animal, after shearing, is immersed in a strong decoction of tobacco, mixed with a little sulphur. The foot-rot is found in Contra Costa, and also a mild form of pneumonia, where proper feed and shelter are wanting. In Alameda the liver-rot and sore-mouth were brought in a flock imported from the east, and these maladies were communicated to flocks before healthy.

In a large number of cases above cited the disease was the result of defective nutrition, bad quarters, and other ill treatment. Very earnest complaints come from various parts of the country, especially the South, in regard to the ravages of dogs, which are productive of far greater loss than all the maladies the sheep is heir to.

DISEASES OF HOGS.

The lack of well-defined terms of description renders it difficult to classify the diseases of hogs in various parts of the country. The term "cholera" is especially indefinite, it being used in some localities as a general name for all kinds of hog-disorders. In Carroll County, New Hampshire, a few hogs confined in stables with sick horses exhibited symptoms decidedly analogous to epizooty. Bristol county, Massachusetts, reports a loss of 1 per cent. by cholera. In Orleans and Franklin Counties, Vermont, pigs and shoats were affected by an unknown disease, being taken with a weakness in their hinder parts, which they drag a few days and then die. An unknown disease caused a small loss in Suffolk County, New York. In Orange County a few cases of cholera are reported among hogs brought from the West. Traces of cholera appear also in Northampton and Beaver Counties, Pennsylvania, and in Baltimore and St. Mary's Counties, Maryland.

In Virginia the term "distemper" is occasionally interchanged with cholera, and is scarcely less indefinite. The losses were light in Campbell, Bedford, Sussex, Warren, Halifax, Northumberland, Stafford, Wythe, Gloucester, Augusta, Highland, and Southampton. In Floyd the deaths amounted to 5 per cent.; in Westmoreland, 5 per cent.; in Russell, 15 per cent. In Spottsylvania the disease was cured, in many cases, by mopping the throat with tar. In James City County the mange carried off 20 per cent. Sulphur was administered with good effect in some cases; but the most effectual method of arresting the disease was killing the infected animals. In North Carolina light loss from cholera was felt in Davie, Cumberland, Ashe, Mitchel, Stanley, Rutherford, Alexander, Rockingham, Union, Alamance, and Greene. In Burke the loss was 10 per cent.; in Chowan, Currituck, and Randolph, 5 per cent.; in Caldwell, 20 to 25 per cent.; in Lincoln, 50 per cent. In Franklin the disease was very fatal and without remedy, discouraging greatly the business of hog-raising in the future. In Yancey quinsy and cholera prevailed to some extent, the loss being 2 per cent. The staggers was troublesome in Carteret and Randolph. Severe visita-

tions of cholera are reported in Clarendon, Barnwell, York, and Newberry Counties, South Carolina. In some cases a drove was relieved of the malady by changing fields. In York County symptoms of influenza, similar to epizooty, and followed by total blindness, was fatal in many cases. In Georgia cholera or distemper was light in Marion, Muscogee, Lumpkin, Wilkes, and Dooly Counties. In Jackson it was more severe, and no effective remedy was found. In Jefferson and Pike the loss was 5 per cent.; in Upson and Schley, 10 per cent.; in Gilmer, 15 per cent.; in Brooks it amounted to one-third of the whole stock. In Pulaski 90 per cent. of the hogs were affected with "red rust," probably the disease known in other localities as "red mange."

In Madison County, Florida, the thumps and the cholera swept 20 per cent. of the stock; in Levy the thumps was considerably prevalent among pigs. In cases of recovery, nine out of ten die before the age of six months. Cholera was mild in Geneva, Jackson, Saint Clair, Marshall, Walker, and Calhoun Counties, Alabama. In Henry it was more severe, the loss amounting to 20 per cent. The "red mange" was very severe in Walker and Wilcox, in some localities sweeping three-fourths of the hogs. In Bolivar, Lee, and Lowndes Counties, Mississippi, losses from cholera were light. In Tunica they amounted to 10 per cent; in Coahoma to 15 per cent. In Lafayette, cholera and "red mange" carried off 25 per cent. The latter disease produced 25 per cent. more deaths than usual in Tishemingo. In Jones County many died of kidney worms. Some cholera is reported in Morehouse, Avoyelles, and Bossier parishes, Louisiana; in Tangipahoa the loss was 20 per cent.; in Cameron, charbon, cholera, and colds reduced the stock 40 per cent. In Upshur County, Texas, about two-thirds of the hogs on hand January 1, 1872, died during the year, while one-third the usual number of pigs were born. The quinsy was general; many had boils on the liver; others were injured by the kidney-worm. In Collins and Montgomery many were poisoned with cockle-burs. In Dallas and Atacosa some cholera prevailed, and in Marion it resulted in the death of about 25 per cent. of the stock. In Kaufman an influenza, resembling epizooty, destroyed 25 per cent.

In Arkansas, so-called cholera was very destructive in several counties. Sebastian County lost 30 per cent.; Madison, 7,000 hogs; Cross, 33 per cent.; St. Francis, nearly all. In Clarke, cholera and red mange destroyed one-half, and in some localities of Columbia three-fourths of the hogs. It was also reported in Randolph. In Hot Spring, kidney-worms combined with cholera to swell the heavy loss. Some animals on being killed were found permeated with worms. Heavy losses were experienced in different counties of Tennessee: Loudon, 20 per cent.; Montgomery 15 per cent.; Dyer, 50 per cent.; Jefferson, 20 per cent.; Henry, in some neighborhoods, 60 per cent.; Madison, in some places, 75 per cent.; Humphreys, 20 per cent.; De Kalb, 25 per cent.; Williamson, 20 per cent.; Jefferson, 20 per cent.; Robertson, 10 per cent.; Cannon, 10 per cent.; Lewis, 10 per cent.; Weakley, 10 per cent.; Lawrence, one-ninth; Davidson, one-eighth. Minor losses are reported in Smith, Lincoln, Fayette, Campbell, Wayne, Grundy, Bedford, Jackson, Putnam, Monroe, Hickman, Hamilton, Maury, Polk, Greene, Giles, Fentress, and Hancock. In some cases quinsy and pneumonia were troublesome. The following from Gibson reports the disease somewhat at length:

> The fatality among the hogs during the past year has been very great, many farmers losing almost their entire stock and others nearly one-half. For want of a better name, the disease was usually termed "cholera," though no symptoms of that disease were manifested in any of its stages. It first made its appearance in the latter part of

July, and continued until the frost, when it ceased. It spread very rapidly and numbered its victims upon every farm. The extremely dry weather that prevailed led many to suppose that it was caused by the inhalation of dry dust, or famishing for want of water. The symptoms were: first, a dry cough, running at the nose, constipation of the bowels, and a general prostration of the whole system. A reeling, straggling walk, with loss of flesh, though the appetite continued good, usually denoted its approach; a cough was also present. Some treated for disease of the liver or kidneys, but without success. All efforts at treatment or staying the progress of the disease were futile. In my own experience I found a diet of warm kitchen-slops, with bran and salt, afforded the greatest amount of temporary relief. Before death a slight purging usually took place, with froth or foaming at the mouth. The duration of the disease, from its invasion to its fatal termination, was usually from a week to ten days. About 33 per cent. of the hogs of this county died from this disease. In its general features it resembled more particularly the "epizooty" of the horse than "hog cholera," and might have been so called if the "horse disease" had then been known.

In Putnam County, West Virginia, some neighborhoods lost 75 per cent. from cholera; Boone averaged 25 per cent., generally the best hogs; Graves 20 per cent.; Kenton, Johnson, Butler, Mason, and Kanawha, 10 per cent. each; the loss was light in Cabell, Jackson, and Hardin. Some quinsy was reported in Pendleton. In Morgan a few cases of "blue sickness" yielded to alum dissolved in meal-slops, two or three doses being sufficient in the earlier stages. The aggregate loss was heavy in several counties of Kentucky; Christian and Ohio, 25 per cent. each; Spencer and Graves 20 per cent. each; Johnson, Daviess, Kenton, Warren, Butler, and Rockcastle, 20 per cent. each; smaller losses were felt in Clarke, Shelby, Jefferson, Jackson, Lewis, McLean, Trimble, Anderson, Boone, Breckinridge, Lane, Lincoln, Livingston, Carroll, Hopkins, Oldham, Russell, Magoffin, and Adair. In Grayson one-third of the cases were fatal. In Nicholas disease was confined to distillery-hogs. In Metcalfe the mange was unusually severe. Quinsy and measles are incidentally mentioned in one or two cases.

North of the Ohio River, hogs appear to have been comparatively healthy. Jefferson County, Ohio, reports a loss of 2 per cent., while traces of disease are found in a few other counties. In Michigan and Wisconsin every county reports no prevailing malady. Indiana and Illinois, however, are less fortunate. In the former State Johnson County lost 75 per cent.; Morgan, 33 per cent.; Gibson, 30 per cent., with a declining interest in hog-raising; Warrick and Owen, 10 per cent. each; Grant, Perry, Decatur, Huntington, Warren, Dearborn, Carroll, Cass, Howard, Clinton, Parke, Clay, Hamilton, Posey, Martin, Tipton, and Newton, smaller losses, sometimes trifling in extent. An occasional case of thumps varies the record. In Wabash County, Illinois, 75 per cent. of the young hogs died. In Pope County the loss from all causes was 30 per cent.; Pulaski and Clinton, 25 per cent. each; Mason, Franklin, and Putnam, 20 per cent. each; Pike and White, 10 per cent. each; smaller losses in Vermillion, Morgan, De Kalb, Schuyler, Carroll, Grundy, Montgomery, Hancock, Sangamon, Wayne, and McLean. In Franklin County many of the best-fed hogs died of a new and unknown disease, commencing with weakness in the hind legs, which the animal dragged after him, from twelve to twenty-four hours, and then died, the carcass assuming a very dark color. In Macon County disease appeared to run in droves; one man got rid of it by selling out his stock and repurchasing. The influenza, analogous to epizooty, appeared in Putnam and Saint Clair Counties.

In Washington County, Minnesota, there was a loss of 7 per cent., no other county in the State reporting any casualties. The different forms of disease were more virulent in Iowa, Adair County losing 30 per cent.; Tama, 25 per cent.; Polk, 20 per cent.; Mahaska, 15 per cent.; Louisa, and Fremont, 10 per cent. each; Ringgold, Iowa, Marion, Clinton, Cass,

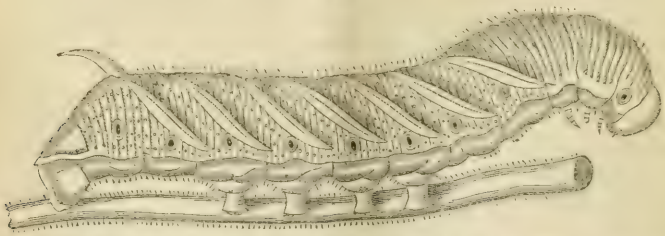
Jasper, Page, Johnson, Lucas, and Dallas, 5 per cent. or less. In Johnson, from 500 to 1,000 hogs died of cholera and quinsy. In Powieshiek, an unknown disease swept 25 per cent. of the pigs. In Muscatine, the "anthrax fever" prevailed in some localities, but was not general. In Pulaski County, Missouri, one-half the hogs died. Pemiscot and Worth lost 20 per cent.; Barry, 15 per cent.; Ozark, 25 per cent.; Grundy, Linn, and Wright, 10 per cent.; smaller losses from cholera, pneumonia, &c., were reported in Caldwell, De Kalb, Bolinger, Callaway, Daviess, Moniteau, Perry, Carroll, Stoddard, Marion, and Lincoln. In Holt County, one-half the young hogs were destroyed by a singular disease, the prominent symptoms of which were cough and swelled throat; one-third of the older hogs died from another malady, characterized by stupidity, loss of appetite, &c., sometimes obviated by merely changing the animal's quarters and bedding. The above symptoms strikingly resemble the epizooty. In Nodaway, kidney-worms destroyed 15 per cent. of young hogs. But two counties in Kansas—Brown and Chase—report losses, and in both cases light. In Nebraska, Cass County lost 10 per cent.; Richardson and Pawnee, a few cases each. In Alexander County, California, some Kentucky hog-pedlers imported diseased animals, which infected others there and in other counties. In Mendocino County kidney-worms were somewhat troublesome.

ENTOMOLOGICAL RECORD.

By Townend Glover, Entomologist.

The tobacco-worm.—The tobacco hawk-moth or "horn-blower" of Maryland, *Macrosila* (*Sphinx*) *carolina*, Linn., is a large moth, the caterpillar of which, commonly known as the tobacco-worm (Fig. 3) in the

Fig. 3.



Middle States, is very destructive to the leaf of the tobacco-plant, when the worm is young, by eating holes in the leaves, thus spoiling them for use as wrappers for cigars, and when old by devouring the whole of the leaf itself. These worms appear of all sizes, during late summer and autumn, in the tobacco-fields in Maryland, the first brood of eggs hatching in May or June.

During the last season the Department has received numberless letters on the subject of their ravages, desiring information concerning their habits, and the best remedies that can be suggested for their destruction. We shall therefore give a short description of their transformations from the egg to the perfect fly. The egg is deposited singly on the leaf of the tobacco or tomato plant, and the young worm when first hatched out by the heat of the sun commences to eat holes in the leaf of the plant, and sheds its skin several times before attaining its full

size; it then goes into the earth and the pupa (Fig. 4) is formed in a subterranean cell, the late broods remaining as pupæ all winter, and coming out as the perfect fly the following spring. The insect (Fig. 5) appears from June and July until late fall. It hovers in the twilight like a humming-bird over flowers, especially honeysuckle and Jamestown weed, *Datura stramonium*, sucking the nectar by means of its long, flexible tongue, which, when the insect is at rest, is coiled up like a watch-spring under the head. The tongue when unrolled measures four to six inches in length, and the caterpillar feeds also on the potato, red pepper, and tomato, as well as the tobacco. This insect is almost exactly like the northern so-called potato-worm in all the states of larva, pupa, and insect, and can scarcely be distinguished from it by young entomologists; but in the "tobacco-worm" the anal horn on the tail of the caterpillar is *reddish* instead of bluish; it also has no longitudinal white stripe, the pectoral feet are ringed with black, the body is more hirsute, and the insect itself is more indistinctly marked, and always has a white mark at the base of its wings and partly on the thorax, (Fig. 5) which the moth of the potato-worm has not. (Fig. 6.)

Fig 4.

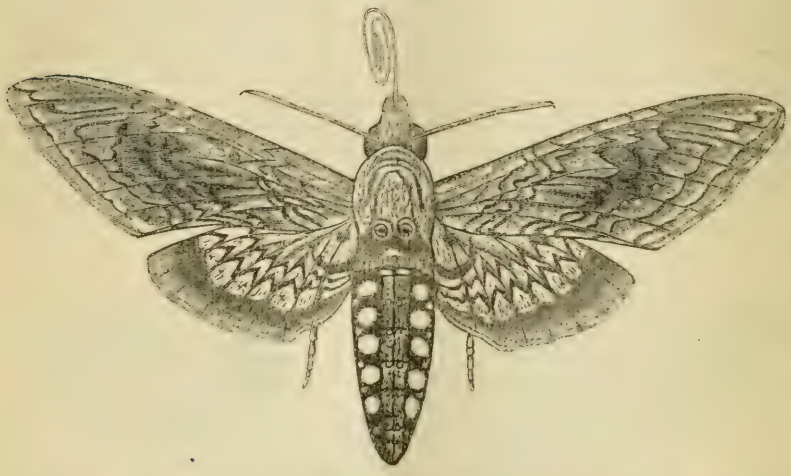
Fig. 5.

The potato-worm is also found feeding on the tobacco in Maryland, and frequently a black or nearly black variety of the worm is taken, especially towards the end of the season. The potato or tomato worm has also been accused of being poisonous, but this is entirely erroneous, as the horn on the tail of the caterpillar is incapable of inflicting any serious wound, and has no poisonous properties whatever. The potato-worm is the northern species, and in Maryland the two species meet, and are found indiscriminately together in the tobacco-fields, yet never mixing, but remaining perfectly distinct, although so nearly allied in appearance, habits, and food.

There are several parasites, and one in particular, that is very useful in destroying the potato and tobacco worm. It is a minute, four-winged fly, (*Microgaster congregata*,) which deposits its eggs in the caterpillar, and eventually kills it. The eggs of this parasite, to the number of one hundred or more, are deposited in the back and sides of the caterpillar, in small punctures made by the ovipositor of the fly. The larvæ, when hatched, feed upon the fatty substance, and when fully grown eat

a hole in the skin, and each maggot spins for itself a small white oval cocoon, one end of which is fastened to the skin of the worm, and the caterpillar appears as if covered with small oval white eggs. Eighty-four flies were obtained from one caterpillar by Say, and Fitch counted one hundred and twenty-four cocoons on another worm, so that these insects must destroy a great number of worms. The parasite, however, is said to be destroyed by another hymenopterous insect, (*Pteromalus tabacum*,) which deposits its eggs in the cocoons of the microgaster. Another species, forming an immense mass of loose woolly cocoons, is also said to kill the caterpillar of the potato-sphinx, and most probably

Fig. 6.



attacks also that of the tobacco-worm in a similar manner. It is, therefore, of great consequence when destroying the caterpillars by hand-picking to avoid crushing or injuring any caterpillars which appear to have either white floss or egg-like cases on their backs or sides, as these are the cocoons of a very useful insect, which, if left undisturbed, would produce multitudes of flies, which would destroy an immense number of these injurious worms.

The hornets, and an orange-colored wasp, taken by Walsh for a *Polistes*, devour the caterpillar when young and small. The best remedy against these insects, however, is to poison the fly which produces either the potato or tomato worm, by dropping a mixture of "blue stone" of the druggists, or crude black arsenic, into the flower of the Jamestown weed, or stramonium, in the evening, when the fly will come and insert its long proboscis into the flower, sip up the poisonous mixture, and die before depositing its eggs.

A correspondent from Tennessee finds it advantageous to cultivate a few plants of the Jamestown weed among his tobacco, and then to poison the blossoms, as they appear, with the above-mentioned liquid, every evening, and has thereby saved a great part of his crop uninjured. In Maryland some tobacco-growers utilize young turkeys by driving them into the tobacco-field, where they pick the worms from the leaves. Some planters also pay a small premium to children for the dead millers or flies, which are readily killed with a piece of shingle or board as they hover over the flowers in the evening twilight.

CHEMICAL MEMORANDA.

By Wm. McMurtrie, Chemist.

Proximate analysis.—Proximate analysis may be classed among the most difficult processes of analytical chemistry. It not only requires patience, but often yields results which fail to produce the satisfaction desired. To reduce the difficulties to a certain extent, and to devise a method which will yield satisfactory results, and insure economy in time and expense, has been in part the object of the work in the laboratory during the past two months, and, as was stated in our last month's report, we shall now proceed to the publication of our method of analysis.

Since the separation of the several proximate principles depends upon the action of different solvents, the work of devising a method of effecting it obviously consists in the selection of such as are best suited to the purpose, as well as the best means for applying them. In the selection of solvents, attention must be paid to their *wetting* powers as well as their power of solution. Thus ether will dissolve a larger proportion of oil than bisulphide of carbon, but the latter being more penetrating will extract the oil from the meal more readily than the former. We have therefore chosen as solvents to be used in the following method, bisulphide of carbon, alcohol of 85 per cent., water, and dilute acid and alkaline solutions.

The best mode of extraction of the different principles with solvents is by percolation, and this operation may be very materially aided by the use of the Bunsen pump. In order that the residues may be dried and weighed without destroying the filter, Munroe's porous earthenware cones, 1½ inches in diameter, are used, and these are fitted into glass funnels by means of a ring of rubber tubing.

The material having been carefully and finely pulverized, take two samples of 2.5 to 3 grammes each, heat at 130° C. until constant weight is obtained, in order to determine the moisture. Then place them upon the porous cones and determine the oil by extraction with bisulphide of carbon. The residue after this extraction, as after each succeeding one, must be dried at 130° C. until constant weight is obtained. The oil having been removed, the two samples are treated for zein, sugar, and gum as follows: Let the cones be numbered respectively 1 and 2. Treat the contents of No. 1 with alcohol of 85 per cent., which will remove the zein and sugar. After having dried and weighed it, treat the residue with water to remove the gum; dry and weigh. Treat the contents of cone No. 2 with water to remove the gum and sugar; dry and weigh. The amounts of zein, gum, and sugar may now be calculated as follows:

Treatment of No. 2 with water = gum and sugar.

Second treatment of No. 1 = gum.

First treatment of No. 1 = zein and sugar.

Gum + sugar − gum = sugar.

Zein + sugar − sugar = zein.

The substance having been treated as above is transferred from the cone to a beaker 12 inches high and 3 inches in diameter, and boiled for two hours with 200 c.c. of water containing 0.5 per cent. of sulphuric acid. As the water evaporates it must be supplied. After boiling, the beaker is filled with hot distilled water, the residue allowed to settle, and the clear supernatant fluid is drawn off as completely as possible, by means

of a siphon, without disturbing the residue, which is then transferred to the filter, washed with boiling distilled water, dried and weighed. The loss denotes the amount of starch, and the residue consists of albuminoids and cellulose. These may be separated by treatment with water containing 5 per cent. of caustic alkali, which will remove the former, leaving the latter as a residue.

The ash is determined by taking another sample of 2.5 to 3 grammes, and incinerating it in a platinum crucible. The mineral matter is then deducted from the various principles with which it may have been removed in the process of extraction. We have determined by experiment that extraction of the different substances removes the following percentages of the whole amount of mineral matter present for each of the constituents. Thus the amount removed with—

	Per cent.
Zein	7.5
Albuminoids and cellulose	10.5
Gum	37.6
Starch	44.4

The nitrogen should be determined as a check upon the zein and albuminoids.

Since a great deal of time must necessarily be lost in working the above method, we prefer the following, which, although it involves the same principles, may be prosecuted in much less time.

For this method weigh out five samples of 2.5 to 3 grammes each, place them upon porous cones which have been previously washed and ignited, and numbered respectively 1, 2, 3, 4, and 5, heat at 130° C. until constant weight is obtained. Treat the contents of cone No. 1 with bisulphide of carbon, dry and weigh. Before weighing, the residues must be well dried at 130° C. Loss in weight of cone and contents = moisture and oil.

Treat the contents of cone No. 2 with bisulphide of carbon and alcohol of 85 per cent. consecutively, without removing the cone from the filtering funnel. After this is done dry and weigh. Loss = moisture, oil, zein, and sugar. In the same manner treat the contents of cone No. 3 with bisulphide of carbon and water. Dry and weigh. Loss = moisture, oil, gum, and sugar. Treat cone No. 4 with bisulphide of carbon, alcohol of 85 per cent., and water. Loss = moisture, oil, gum, sugar, and zein. Treat cone No. 5 in the same manner as No. 4, and, without drying, transfer the contents of the cone to the tall beaker described in the former method, and proceed with treatment for starch as described above. After the starch is removed, the albuminoids, cellulose, and mineral matter are determined as in the preceding method.

We give below the composition of two varieties of Indian corn, which were analyzed according to the above method. These were chosen to represent the crops of the North and South; as was stated before, the yellow corn represents the Northern crops, and the white corn those of the South. On comparing the two analyses it will be seen that the variation in composition is not very great, the gum, sugar, and albuminoids being the most variable.

No. 1 is a sample of yellow corn grown upon the farm of the Commissioner of Agriculture, in Pennsylvania. Although the analysis of this sample was published last month we reproduce it here for comparison, and give it calculated for dry substance. No. 2 is a sample of white corn grown upon the eastern shore of Maryland.

No. 1.

	Undried substance.	Dry substance.
Moisture	8.87	.....
Oil	5.17	5.67
Sugar	1.10	1.21
Gum	1.23	1.35
Zein	1.98	2.17
Starch	70.66	77.54
Albuminoids	7.94	8.71
Cellulose	1.72	1.89
Ash	1.33	1.46
	100.00	100.00

No. 2.

	Undried substance.	Dry substance.
Moisture	8.03	.....
Oil	5.61	6.10
Sugar	2.45	2.66
Gum	0.97	1.06
Zein	1.45	1.58
Starch	70.36	76.50
Albuminoids	8.36	9.09
Cellulose	1.53	1.66
Ash	1.24	1.35
	100.00	100.00

NOTES FROM FOREIGN JOURNALS.—We quote the following from M. Maumevé's "*Fermentation without Ferments*," published in *Les Mondes*: "Heretofore no real explanation of the rôle of manures has been given, but a little reflection readily shows the interest contained in the explanations furnished by my theories upon the alterations of the salts and their application to the nourishment of plants. It is quite clear that the soluble matters employed as manures are either very stable or are easy to decompose. Their degree of stability affects their nutritive value. But this stability has not, as yet, been attached to any known principle. The principle of my theory, just spoken of, shows the enormous influence of the inequality of the equivalent weights of the acid and the base upon the salts. An active manure is one which presents this inequality, because it will certainly give rise to other salts which show but little or none. The manure will be not only *active* but especially *nutritious*, if the products of decomposition, conformably to the law of mixtures, are of a nature to be absorbed by the plants, thus facilitating their production by means of the powerful effects of the osmose of the walls of the cells, tubes, &c. The separation of a certain quantity of alkali, as in the alteration of acetate of soda, or a certain quantity of acid, as in producing other salts, explains the movements of vegetation, the formation of insoluble deposits, &c. This subject is one to which I shall return, in order to show, by examples, in what manner my new discovery may become valuable."

Sugar-beets.—M. Corenwinder, in the name of the Agricultural Station of the North, in France, has determined, from experiments, that those beets are richest in sugar which produce less weight. Cultivators should, however, consider the fact that it is possible to obtain beets which are at the same time rich in sugar and of high specific gravity. For this, it is necessary to increase the number of experiments, sow seeds producing rich beets, improve by judicious selection, and renew the varieties which may degenerate. M. Corenwinder also relates the following fact which he has recently observed: "It is disadvantageous to cut the leaves from the beets after they have been gathered, for when they are left for some time in this decapitated condition, the sugar disappears in considerable quantity, on account of an elaboration which takes place in the cells with a view to the production of new buds."

Professor Jellet, president of the Royal Irish Academy of Dublin, has made the following experiments upon the growth of sugar-beets in Ireland: Four specimens were taken, and in the growth of one the manure used was common salt; in the second case sulphate of potash was used; in the third case no manure was used, and in the fourth case sulphate of ammonia. By optical experiment it was determined that the yield in the first case was 79.99 per cent. of water and 12.72 per cent. of sugar; in the second case, 80.27 per cent. of water and 13.18 per cent. of sugar; in the third case, 80.60 per cent. of water and 12.42 per cent. of sugar; and in the fourth, 80.52 per cent. of water and 12.54 per cent. of sugar.

Lunar light upon vegetation.—Mons. P. Charbonnier, in a communication to the *Journal d'Agriculture Pratique*, states that lunar light exerts a material influence upon aquatic vegetation. This fact was first noticed from the increased growth of cryptogamic vegetation upon the sides of an aquarium. It was observed that during the time of full moon it was much more luxuriant than during the time of the new moon. This led to other observations with regard to it, and it was found that aquatic vegetation generally is affected in a similar manner.

New coloring matter.—M. Harston has extracted from *Agaricus fasciculatus* a coloring matter soluble in ether and crystallizable in plates, to which he gives the name *Mycoraphine*, and another matter, which he named *Mycostearine*, insoluble in ether and water, and present under the form of granules which have a reniform structure.

The red berries of *Solanum dulcimara*, those of *Tamus communis*, and *Asparagus officinalis* have also furnished a red granular substance, crystallizable in plates. It is insoluble in water, but soluble in alcohol and ether, and especially in benzine. Sulphuric acid colors it blue. It is easily fixed upon silk.

Rhizoctone.—*Les Mondes* of February 6, contains a statement to the effect that beets grown in the vicinity of Eghezer are affected by a peculiar malady heretofore unknown to agriculturists. The roots are covered with numerous and tangled filaments, which upon examination prove to be a fungus of the genus *Rhizoctone*. This fungus is developed upon the roots of certain vegetables, constituting a terrible malady. It has heretofore been noticed upon saffron, lucerne, &c. Whole fields of these have been destroyed by it. It has also been found upon potatoes, and now it has appeared upon beets in Belgium.

Lacquer.—C. Puscher prepares a lacquer of oleate of alumina, which will stand quite high temperatures, in the following manner: to a solution of alum is added a rather dilute, boiling solution of soap. The precipitate which is formed is allowed to settle, the fluid decanted, the former collected upon a filter, washed with boiling water and dried. It is quite trans-

parent, and is soluble in all proportions in turpentine, and when dissolved in it may be applied to all the purposes for which *lacquer* is used. After its application it should be dried quickly at about 50° C.

Freezing of plants.—Professor Fr. Mohr, reasoning from certain observed facts, believes that the destruction of plants by freezing is due to the expansion of the fluid in the cells, thus bursting their walls and stopping the processes of vegetation. The destruction is effected principally in those plants which have large cells, and therefore containing a large amount of fluid, while those provided with small cells, and consequently containing but a small quantity of fluid, remain uninjured. If, however, the latter be attacked before the fluid has disappeared from them sufficiently in the fall, or after it has re-appeared in the spring, they will also be affected. He also states that it is impossible to determine the temperature at which plants (sprouts of vines, potatoes, &c.) are destroyed, since it is probable that they may become much cooler by radiation than the shining bulbs of the thermometer.

BOTANICAL NOTES.

By Dr. George Vasey, Botanist.

Interesting example of fasciation.—Several specimens, showing an abnormal vegetable growth of the variety called fasciation, have been sent by Dr. A. Schottman, of Texas, who gives the following history of the case:

About twelve years ago a small shrub of a kind of sophora, growing in the mountainous region of Texas, was planted in my garden. It grew very well, and a few years afterward, in early spring-time, it became covered with buds, promising an abundance of flowers. But the first year all these buds dried and disappeared, but the *peduncles* increased, both in length and breadth. A few weeks later the shrub was adorned by handsome hangings of a silvery-gray color, like white cockscombs. The stipules of the aborted flowers were very numerous and somewhat aculeate. In the winter following, these hangings (malformed peduncles) fell off, and in the spring of the next year *new* buds made their appearance, on new peduncles. Since that time, about six or seven years ago, my shrub has been every year very ornamental, bearing an abundance of violet flowers and handsome legumes. In the fall of 1871 the soil around my sophora was cleaned, manured, and plowed, and in the spring of 1872 the shrub *anew failed* to produce flowers; only the above-described hangings covered it. Last winter, although a long and hard one, did not kill these deformities, and now, in the middle of March, 1873, they are almost all covered with flowers.

This kind of abnormal growth occurs in many herbaceous plants, as in celosia or cockscomb, and occasionally in woody plants. It generally consists of a flattening and expansion of the stem or branch, with an unusual development of buds produced without regular order. Several causes have been ascribed for this monstrosity. Professor Hinks explains it on the principle of adhesion, arising in cases where, from superabundant nourishment, especially if accompanied by some check or injury, numerous buds have been produced in close proximity. It is stated that the means employed by horticulturists in the cultivation of the cockscomb, so as to insure the production of the very large flower-stalks for which this plant is admired, is the application of a large quantity of stimulating manure and the maintenance of a high temper-

ature. In woody plants this deformity is generally confined to some of the branches, its occurrence in the flower peduncles being rare. The specimens of the sophora above mentioned (*Sophora speciosa*, Benth.) are affected in different degrees, some showing the peduncles but little flattened and expanded upward like a club, while the largest is 9 inches long, swelling out in the shape of a trumpet, but perfectly flat, 5 inches broad at the summit, which is plaited, scolloped, and gashed or split into several sections. The flattened surface is covered with a multitude of small points, which are undeveloped flowers, each of which has a small pointed bract below the bud, and in several places toward the summit a number of the buds have developed into ordinary flowers, irregularly scattered, each with a short pedicel. About twenty-five of these flowers occur on one specimen, while the undeveloped buds amount to several hundred. In the normal state the flower peduncles fall off after the maturity of the flowers or fruit, as they did in this case until the last year; the persistence of these abnormal, hypertrophied peduncles, and the subsequent development of flowers upon them, being very remarkable. The tree which is the subject of this peculiarity much resembles the *Sophora japonica*, and would probably be equally ornamental in cultivation. In Texas it is evergreen, the specimens showing last year's leaves and also young ones of the present season.

CONSULAR COMMUNICATIONS.

THE VINE DISEASE IN FRANCE.—THE PHYLLOXERA VASTATRIX.—The Department of Agriculture has received, through the Department of State, the following communication from M. M. Price, esq., United States consul at Marseilles, embracing a variety of statistics in reference to the origin, nature, and extent of the disease which for several years has so extensively devastated the vineyards of France:

It is now nearly ten years since certain cultivators at Pujaut, Roquemaure, and Villeneuve, in the department of Gard, a few miles from Avignon and on the right bank of the Rhone, called attention to a new disease of the vine. It was first called "*la pourridie*," (the rot,) from the fact that the vines which died were found to have their roots completely rotten. No attention was paid to the matter except by those immediately interested, who found their vines rotting away from year to year, without any of the remedies tried having proved efficacious in arresting the increasing mischief. Four years passed, and the "rot" continued, thus unnoticed, to pursue its destructive work in the best-cultivated wine district of Provence and Languedoc, until the severe winter of 1867-'68 developed the evil in such proportions that at length, in the summer of 1868, was sounded the first note of alarm, which came from a committee appointed by the prefect of Gard to examine the nature and explain if possible the causes of the new disease. The committee reported the discovery of a microscopic insect feeding upon the roots of the diseased vines. Professor Planchon, of the College of Montpellier, claims the honor of having classed and named the interesting bug. He called it at first the *Phyzaphis vastatrix*, but afterward changed it to *Phylloxera vastatrix*. It was found upon examination that the insect commenced its work by attacking the hair-like filaments of the vine-root, thence gradually extending its ravages through the entire *plexus* of radicles and larger roots, till all was rotten and destroyed. A singular thing noticed was that generally the vine preserved its usual healthy appearance, gave its usual complement of grapes, and then suddenly collapsed and died. By degrees public attention was excited. The Minister of Agriculture and Commerce, the Academy of Sciences at Paris, and the Society of Agriculturists of France, instituted inquiries. A reward of 20,000 francs was offered by the government to whoever should discover an effectual remedy, and other smaller rewards were offered by departmental societies, which have never yet been claimed. In the fall of 1868, M. Mares, secretary of the agricultural society of Hérault, made an excursion through the infected region to ascertain the extent of the disease and the direction of its course. He found it to extend from Roquemaure in Gard, north to Rochegude, in Drôme, and south

a little beyond Arles, in the Bouches-du-Rhône, a distance of nearly one hundred miles, while east and west the distance was about seventy-five miles. Of Roquemaure, he says: "That beautiful vine-country, which last fall was in full prosperity, covered with vines, young and old, the cultivation and care of which are perfectly understood, is this year in greater part attacked and most of its vines dead or dying." He found the district of Ramières completely devastated, and the disease extending in every direction. No remedy having yet been found, the march of the disease has been unimpeded, and is thus traced in a recent publication: "In 1864 the Phylloxera crossed the Rhone from Gard to Vaucluse, and in that and the following year desolated many vineyards at Sorgues, Camaret, Sainte Cecile, and Châteauneuf du Pape. In 1866 it descended to St. Rémy, Graveson, and as far south as La Crau de St. Martin in the Bouches-du-Rhône. In 1868 it was at Terrascon, Senas, and Cadarache. In 1869 it had invaded the country around Arles, Orgon, and Miramas, the plain of Vannage, and the famous vineyards of Langlade, in Gard. In Langlade it destroyed vines planted in the days of the regency—one hundred and fifty years ago. In 1870 it appeared at Lunel, St. Jean de Lucules, and St. Gely du Fesc. The country of the famous Muscat wines, in the department of Hérault, up to that time had been considered untouched.

In 1871 it continued its march through Hérault in a southwesterly direction, and attacked Mauguio, Cadenet, Boisteron, Lattes, and Vendargues, to the south of Montpellier, and in the same year advanced north as far as Valence, in Drôme, and east to some points in the department of Var. It appears that this scourge, after having crossed the Rhone several times, is now marching upon Lower Languedoc, in two nearly parallel columns. One appears to have taken its departure from St. Rémy, in Vaucluse, or from Arles, in the Bouches-du-Rhône, and to have proceeded, going south of Nîmes, toward Cette, crossing Lewel, Mauguio, and Lattes; the other starting from Gigondas, eight or ten miles northeast of Orange, in Vaucluse, crossing Châteauneuf du Pape, in a line north of Nîmes, threatens Béziers in the southern center of Hérault. The district of Laveyron, on the border of Drôme and close to the southwestern corner of Isère, has been reached. Taking the mountain-range of the Cévennes on the west and the departments of Hautes Alpes and Basses Alpes on the east as boundaries, we find all the intervening country more or less ravaged by the Phylloxera.

Starting from Laveyron, in Drôme, going in a southwest line to Cette on the coast of Hérault, thence to Toulon, and back in a straight line to Laveyron, we have a vast triangle of the seven departments whose vineyards are being slowly destroyed. Including Gironde, eight of the most important departments in the richest wine-growing country in the world are reduced to-day to a melancholy condition. Taking them in the order in which they have suffered, they may be placed as follows: First, Vaucluse; second, Bouches-du-Rhône; third, Gard; fourth, Drôme; fifth, Hérault; sixth, Ardèche; seventh, Var; and eighth, Gironde. A few figures taken from official sources will give a more correct idea of the amount of damage suffered. Vaucluse had about 75,000 acres planted in vines in 1868, the average production of wine being about 160 gallons to the acre.

At this time last year 40,000 acres around Orange were destroyed. In the present year, of the 75,000 acres of vines existing in 1868, fully two-thirds are utterly destroyed, and the other third is seriously threatened. The saddest reflection is that the work of destruction has been most complete among the most celebrated brands. In the district of the Châteauneuf du Pape, all the varieties, La Nerthe and others, have been swept away in the common ruin. In the Bouches-du-Rhône fully one-half the vines are dead or dying.

In 1868 there were about 125,000 acres, producing, on an average, not more than 80 or 100 gallons per acre. The disease exists in all the country from near Avignon along the western border to Arles; thence southeast to Berre, and northeast to the river Durance. The most famous brand is produced at Cassis, on the southeast coast, near Marseilles. All the country east of Marseilles may be said to be more or less devastated.

The department of Gard had about 440,000 acres of vines in 1868. Although about 100,000 acres have been injured, the wine-crop will not be sensibly diminished this year. The average production, hitherto, has been about 300 gallons to the acre. The most esteemed brands are those of Tavel, Langlade, and some light wines.

Tavel and Langlade have disappeared. In 1868, a vine produced at Vauvert obtained a gold medal at an exhibition. The *Phylloxera* appears to have appropriated it and several other gold-medal vines to its own use. The department of Drôme, with over 60,000 acres of vines, has suffered more than Gard. The vineyards along the Rhone, in this department, are being rapidly destroyed. Here is produced the renowned "Hermitage," and probably the last crop has been harvested. The wines of Drôme are all of a superior quality. Hérault is the first in rank as a wine-producing department, both in respect to the number of acres and the quantity of production. In 1867, of the 750,000 acres of the cultivated land of the department, there were 410,000 devoted to vine-culture. In the present year there are 530,000 acres. The product per acre was 500 gallons in 1867, and in the remarkable year of 1865 it was estimated at 750

gallons of wine to the acre. In the present year, in spite of the *Phylloxera*, the product of Hérault will reach a probable total of 350,000,000 gallons. As usual, the best brands have been among the first victims of the disease. In Ardèche, situated along the right bank of the Rhone, there are about 80,000 acres of vines. Up to the present the disease has destroyed or badly damaged from 25,000 to 30,000 acres.

In the department of the Var there are about 200,000 acres of vines, producing about 100 gallons to the acre. The principal brands are Gaude and Lamalgue, Bandole, Bansset, Castellet, St. Cyr, and la Cadière, all deep red, solid wines. The damage done in this department will not exceed one-third of the vines. There are in the Gironde about 325,000 acres of land devoted to the vine. The average product is about 200 gallons to the acre. Two years ago the quantity of land attacked by the *Phylloxera* was estimated at 50 acres; but the disease now extends over ten kilometers and is rapidly spreading. It would be wonderful if it did not continue to spread, when during the past summer wagon-loads of diseased vines were carried from the country around Floirac, across the river, to be burned on the Médoc side—an insane proceeding and a sure means of spreading the disease. We shall probably have one or two more crops of the renowned Château Lafitte, Château Margaux, before they disappear. The vineyard of the famous "Hermitage" occupies the side and summit of a hill on the left bank of the Rhone, a short distance north of the town of Tain, in the department of Drôme, and contains about 375 acres. It is worth from two to six thousand dollars per acre. The product of the Hermitage is 212 to 264 gallons per acre. The universal testimony is, that no soil and no species of wine can claim exemption from the *Phylloxera*. It first followed the course of the Rhone, south through a soil which is nothing more than a pine *detritus*. It next attacked the marshy deposits or paludian soil north of Avignon, and since then every variety of ground, whether light or heavy loam, calcareous, argilaceous, or sandy soil, has proved a matter of perfect indifference to the *Phylloxera*, which makes itself at home everywhere. In connection with its appearance at Roquemaure, two phenomena have been noticed, which preceded, and it is supposed may have had much to do with, its rapid development. The first is the extraordinary length of a period of drought in a country accustomed to mild visitations of that nature; and the second is the unusual severity of the winter of 1867–'68. The drought lasted eighteen months, and the cold froze everything that would freeze, splitting the vines and opening the ground in long, deep fissures. The vines thus split open were found in almost every instance to be filled with *Phylloxera*, and the theory is, that the insects left those insecure dwellings in search of better, using the fissures in the ground as sheltered roads through which to travel. This is all very plausible, and even true, but it is now known that at a certain period of its short life this microscopic animalcule becomes a winged creature. It is extraordinarily prolific. A single female will become, in the third generation, the happy grandmother of eight millions of her own living images. It has not yet been settled whether this insect is male and female or exclusively female. The winged individuals are all females, and so far as observed, those that do not become winged are also females, and much more prolific than the former. The hope was indulged by some that the insect, whether the cause or consequence of the disease, was generated by the climatic conditions spoken of and would disappear of itself in time, if the unfavorable conditions ceased. But here again science is at fault. The word "unfavorable" here means favorable to the insect, and it would appear that all kinds of weather are equally favorable to it. Intense cold and intense heat find and leave it in the enjoyment of robust health and perfect contentment. Never was there a living creature so charmingly resigned to all the accidents of checkered existence. It cannot be drowned, for after having been kept in water for two weeks, it emerges from its bath a fresh and frisky creature ready for the next vicissitude. Professor Planchon asserts that the *Phylloxera* is a "Yankee invention," which others deny. The professor quotes C. V. Riley, of Missouri, Asa Fitch, of New York, and Mr. Flagg, of Cincinnati, who say that the American *Phylloxera* is identical with that now ravaging France. It was introduced with certain American grape-vines, says the professor, sent to France by the State Department at Washington. The pamphlets upon the subject of the *Phylloxera* abound, but none have discovered a remedy. Sulphur has failed in some places, and been pronounced effectual in others. Quicklime shows no better record. A distinguished member of the French academy said that the disease was simply due to bad cultivation and negligence, and recommended to pull up the sick vines by the roots and burn them, and it was even proposed to make the thing compulsory upon the cultivator. Inoculation with turpentine, carmine, sulphate of copper, sulphide of potassium, &c., has been tried. Lime in various shapes, pyrites, soot, ashes, a variety of composts, coal-tar, carbolic acid, hot water, petroleum, naphthaline, sulphuric acid, mustard-plasters, arsenic, and a hundred other remedies have been tried, and all have failed to have any effect upon the indurated heart of this horrid little bug. It may be possible that this disease will not cross the Cévennes from the east, but it is just as possible that it may extend west from Gironde and destroy the vines of the intervening country within the next two or three years.

DUTCH OR HOLSTEIN CATTLE.—The following article, written by Charles Mueller, esq., United States consul at Amsterdam, with a view to its publication in the reports of the Department of Agriculture, was communicated to the commissioner by J. E. Whiting, esq., of Concord, Massachusetts, to whom it was addressed:

"Dutch cattle—Holstein cattle—are they kindred or distinct breeds? If kindred, what qualities do they possess in common, and in what do they differ? If distinct, what are their respective merits and demerits?"

Questions of similar tenor have poured in upon this office from different parts of the Union in such profusion that I almost felt duty bound to prepare a reply somewhat exhaustive of the subject. I hereby submit it.

I do not claim originality for the production, it simply being a compilation of extracts from standard works, some of which might not be readily accessible to the American cattle-breeder, and of scraps of information gathered from the lips of different scientific and practical cattle-breeders of Holland. Of the latter, none but acknowledged authorities were consulted, many of the informants at this moment holding prominent and responsible positions in various Dutch agricultural societies.

In one of your letters you ask:

"Are, or are not, the general dairy-stock of Holland, including South as well as North Holland, Utrecht, and Gelderland, as well as Friesland and Groningen, commonly considered, in Holland, as of one race or breed?

"2. Are the cattle of any portion of Holland known or recognized as Holstein cattle, to distinguish them from cattle of other parts of Holland having a different origin; or have you in Holland a favorite breed presumed or believed to have originated in Holstein?"

Both questions have long since been definitely settled, historically as well as physiologically.

Historical authorities upon the subject are numerous, and they generally accept Dutch cattle as the parent stock of not only the present cattle of Holstein, but of many other well-known European breeds.

Extracts from all the works examined in furtherance of this communication would lead to too great voluminousness, for which reason only the more prominent authors are cited. As it is, it becomes necessary to go back some ways toward the days of Adam in order to gain a proper starting-point; and I hope your patience may be adequate to the tediousness of the perambulation.

Scientific farming flourished in the Netherlands* at a time when in other countries agriculture stood where the Roman invader had left it;† and there is every reason to believe that many appliances of modern farming were known to, and made use of by, the Dutch peasantry of remote days. At the agricultural museum of Utrecht may be seen machines handed down from immemorial times, which, beyond all doubt, served to facilitate the process of thrashing, mowing, and other agricultural operations. However, extended remarks upon this head would here be out of place. Moreover, through Mr. Motley's works on the Netherlands, the American reader has fully been made aware of the singularly high degree of Dutch agricultural advancement during the Middle Ages.

This glaring agricultural superiority of the Dutch could not, even at that period, remain unknown to other nations. As a natural consequence, foreign potentates and ecclesiastical magnates exerted themselves to secure the services of Dutch and Flemish farmers for their own selfish purposes—a development of agricultural resources necessarily increasing princely incomes and church-tithes. Thus Dutch settlers found their way to divers parts of Europe, taking with them their cattle and farming implements. It is, therefore, not surprising that such authorities as Professor Law, of Edinburgh, L. Raw, Arthur Young, and others, trace the descent of the celebrated "Shorthorns" of England to Holland.

Borchgrave‡ shows that as early as 1087 William Rufus, who had espoused a Flemish princess, called Dutch agriculturalists to England; and under his successor, Henry I, several Dutch settlements took life in Pembrokeshire, while a flourishing Dutch colony is reported in Yorkshire in 1111. In 1430 a large Dutch colony was founded in Scotland.§ The high estimation in which Dutch cattle must formerly have been held in England may be inferred from the fact that in 1601 the legislative assemblies of the provinces of Holland and West Friesland presented, through the agent Caron, as a valuable gift, six Dutch milch-cows to the lord high admiral of the British Empire.‖

The first Dutch colony in Germany (Thuringia) dates back as far as the year 528, and still recalls itself to mind by such names as the towns of Friesenfeld and Belge-

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* The Netherlands as they formerly existed—the present kingdoms of Belgium and Holland.
† Meiner, Hist., vergl. II.
‡ Borchgrave, Emile de: Histoire des Colonies Belges.
§ Ibid.
‖ Koenen: Geschiedenis van den Boerenstand.

sheim.* From 801 to 864 St. Auskar, (Ausgar, Auscharius,) primate of Bremen, Hamburg, Holstein, &c., himself of Flemish birth, attracted many of his countrymen to those northern regions. Also Charlemagne colonized Flemish peasants on the shores of the Elbe.

That stretch of teeming lowlands east of Bremen to the Baltic wore a vastly different face in early days. Marshy and uncultivated, the coast-edge of those parts stood exposed to the tender mercies of the sea to such a degree that even a slight breeze would suffice to cause submersion; while the inhabitants, through intestine wars demoralized and habituated to strife and broils, evinced little aptitude for the peaceful pursuit of husbandry.† It was then that the attention of German princes was drawn to Holland, where similarly situated regions had been brought to a high state of productiveness. The great tide of emigration, however, did not set in until the twelfth and thirteenth centuries, from which period the origin of the fine grass-lands along the Elbe and Weser must be reckoned.

It was a mighty flow of emigration that wound its way toward those seemingly unfriendly shores, and to this day the peasantry of Holstein have preserved a Dutch ditty‡ which points to the east of Europe as the promised land, just as in our time the Great West of the American Union is the goal of the European emigrant. To conceive the extent of this wave of emigration, a look should be cast upon the map accompanying Borchgrave's work, from which it appears that Dutch settlers gradually spread as far south as Silesia, and even Austria.

In the year 1106 the bishop of Bremen ceded several districts of his possessions to Dutch settlers, with the understanding that all occurring marshes should be drained and converted into meadows, according to the Dutch method of reclaiming lands. Other ecclesiastical, as well as temporal princes, followed his example, and many similar cessions were made to Dutch settlers. It would be quite a task to recount all the charters thus granted; yet I cannot refrain from mentioning some which directly refer to Holstein.

St. Vicelin, having observed how the marshy lowlands near Bremen speedily assumed the character of luxuriant pastures, was the first ruler of Holstein who resolved upon giving his country the benefit of Dutch agricultural science; and to him and his successors that principality is indebted for the great transformation it underwent in the twelfth century. Three districts—Welster, Stor, and Helmshoen—received large Dutch settlements under Adalberon's charter of August 27, 1139, the same containing the proviso that the clergy of said districts should be entitled to harvest and cattle tithes upon the lands of Dutch settlers. This prince, July 25, 1144, further ceded a tract of land to Dutch emigrants in the district of Elmshorn. On January 10, 1221, Albert d'Orlamunde transferred to Dutch emigrants that range of lands situated between the settlements of the Saxons and the Dutch, known as the Vetus Terra. Here it may be mentioned that in 1470 Charles I, King of Denmark, abolished the Dutch land-laws then still prevailing in the districts of Welster and Kempermarsh. There is yet extant a deed of conveyance, in the Dutch language, dated 1340, relating to certain territories in the district of Stor, wherein the Dutch land-laws, then in force, are spoken of. Christiani, Holstein's historian, states that, as regards Holstein, at no time is mention made of other than Dutch colonists, and that Dutch emigration may be said to have commenced in the year 1120. The Count of Holstein personally undertook a journey to Holland, returning with colonists who settled in Wagria. The historian Helmold, in speaking of this colony, admits its importance by stating that it was reported to have consisted of 400 families, but that the number of Dutch settlers in Wagria might safely be taken at 8,000. In 1516 Christian II introduced Dutch settlers on the island of Amack, who soon transformed that waste into a perfect garden-spot. The inhabitants of to-day have preserved their original language, costumes, and habits, and number about five thousand souls. There can be no doubt of the Dutch land-laws having prevailed in Holstein from the emigration period down to the close of the fifteenth century. They were known in Germany under the name of "Hollandereien," (Hollandized lands.) In the present acceptation of the term, however, "Hollandereien" simply means dairy-farms—in itself proof that the Germans consider themselves disciples of the Dutch in this branch of farming.§

Yet enough of historical citations. If they have been introduced rather freely, it was for the purpose of *historically* establishing the fact that Dutch cattle did not originate in Holstein, but that on the contrary Holstein is indebted to Holland for any superior dairy-stock she may possess.

Whoever visits Holstein cannot help being struck with the Dutch aspect of the country, the prosperity of her farming community offering a strong contrast to the generally wretched condition of the German peasant. It is true a German author sought to disprove the assertion of German agriculture having materially been influenced by Dutch colonization. But Borchgrave, it may be safe to say, has effectually disposed of this point of controversy. Probably no author ever will attempt to refute his arguments.

I now proceed to examine the subject in hand physiologically. Quite a number of

* Borchgrave. † Ibid. ‡ Ibid. § Wersebe II.

authorities have been searched in this connection, yet the gist of my remarks has been taken from Professor Hengeveld's* great work on cattle.

Although the human family is composed of many distinct races, physiologists have reduced them to five representative types, the Caucasian race taking first rank. It has preserved its distinguishing characteristics through all ages, no matter what changes, climatical influence, or industrial pursuit may have wrought upon one or the other of its branches.

In this sense Dutch cattle may be called, and in fact are admitted to be, the type of all the different breeds of cattle of Northwestern Europe, and especially of the North Sea and Baltic regions, such as Normandy, Flanders, Denmark, Sleswick-Holstein, Mecklenburg, Pomerania, as far as Dantzic, and the islands of Guernsey, Jersey, and Alderney. The cattle of Hanover, Oldenburg, the Nether-Rhine, and Belgium also must be classed here.

The different cattle-breeds of all these countries, whether of larger or smaller size, whether lighter or heavier, superior or inferior as milkers or beef-cattle, possess the distinguishing characteristics of the cattle of the Lowlands, of which the cattle of Holland are the type. Neither artificial nor natural influences have caused any remarkable degree of outward or physiological changes with any of them.

As a sufficient evidence of the high estimation in which Dutch cattle are held by breeders, the increasing exportation of breeding stock to all parts of Europe may be mentioned. Nor is this exportation of recent date. Buffon relates that Dutch milch-cows were successfully transplanted to Poitou, Aunis, and the marshes of Charente, where they are called Flemish cattle. Villeroy makes the same statement, adding, however, that in the valley d'Auge (Normandy) they are known under the name of Dutch cattle. Weckherlin does not rate Dutch cattle as high for their fattening propensities as he does for their milk-yielding qualities. But it must not be forgotten that the present improved heavy English breeds are of Friesish origin, and that the cattle of d'Auge are chiefly renowned for the enormous weight attained by them.

Although Dutch cattle are of one common race, yet there are many varieties, in time produced through the influences of climate and soil, the greater or less degree of fertility of the latter particularly affecting the animal in its development. Thus the Dutch farmer talks of clay cattle, marsh cattle, sandy-soil cattle, and heath cattle.

And now the question, What are the distinguishing qualities of Dutch cattle?

1. Their milk-yielding properties, in which respect they surpass all other known breeds of cattle. Formerly the average yield of a Dutch cow has been 3,000 Dutch canst of milk per annum. At the present day it cannot be rated at over 2,850 cans. This decrease in milk-supply is not owing to a deterioration of race, but to the bad practice of overfeeding the calves, a habit which the Dutch dairyman follows in imitation of the example set by his ancestors, and which is carried to the extreme.

In the nature of animals it is a fixed law that food, over and above what is required for sustenance and growth, seeks an outlet, thereby more than ordinarily developing one or the other function of the animal organism. With cattle this surplus may take the shape of fat or meat. A calf receiving more food than is required for its sustenance and development must necessarily grow fat, the milk-channels not yet being opened. In this manner a tendency for accumulating fat is created in the young organism at the expense of the milk-yielding properties. On the other hand, let the young animal be sparingly fed up to its first and timely calving, subsequently to be put on a more liberal supply of food, and the foundation for a large milk-supply is laid. Professor Hengeveld considers calving in the early part of the animal's life, together with spare feeding prior to that period, one of the chief conditions of breeding good milkers; because by that process, ere the animal is yet fully developed, the milk-producing organs are early exercised and enlarged by an increased supply of blood; in other words, a good udder is attained.

2. A further physiological quality of Dutch cattle is their capacity for fattening.

It is true, they do not attain the enormous weight of some English breeds; however, this fact is entirely owing to the mode of breeding adopted by the Dutch breeder, who prefers good dairy-stock to heavy beef-cattle.

About a century ago prize oxen weighed 3,000 pounds, prize cows 1,200 to 1,500 pounds. At the agricultural fair of Groningen, 1849, there was on exhibition a four-year old cow weighing 2,000 pounds. It is beyond doubt that Dutch cattle, and on their own native soil too, can be brought to as great a weight as the English and Swiss heavy breeds, while it is generally acknowledged that the meat of Dutch cattle is more palatable than that of the so-called fat races.

3. Another characteristic quality of Dutch cattle consists in their capacity of bringing forth large and powerful calves which are easily fattened. There are instances on record that fattened calves reached 400 old Dutch pounds, dressed weight. Their bulk and vigor endow them with considerable power of endurance, and to this peculiarity

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* G. J. Hengeveld, at this moment professor at the Veterinary College of Utrecht.

† A gallon equal to 4.5435 Dutch cans.

it is partly to be attributed that the future milch-cow matures and prospers in spite of the great hardships Dutch cattle are subjected to. They are turned out early in the spring, and remain in the field until late in the fall, without once tasting the luxury of stabling. And in a climate like that of Holland this is no trifling matter.

Here the report of the Paris (1856) International Fair may be referred to, wherein it is maintained that Dutch cattle, with proper treatment and breeding, can rival the best and noblest cattle-breeds of Europe, irrespective of their qualities as milkers.

4. As the last quality peculiar to Dutch cattle, their stability of race must be named. Artificial as well as natural influences brought to bear upon them during centuries, the former with a view to milk-supply, have given them a constancy of outward form and physiological characteristics, to such a degree that the same can be traced even after many years of propagation upon foreign soil, as, for instance, in England, Normandy, Bavaria, and the Weichsel.

The defects of Dutch cattle are few, and confine themselves exclusively to the outward form. Dutch cattle lack symmetry of form when compared with some cattle-breeds of other countries. Even the several varieties of Dutch cattle, when compared with each other, differ in the outward form. One is bony, coarse, and angular, while another is, to a degree, smooth and finely built. Yet all possess the one fault in common, *i. e.*, disproportion between the bone and soft parts, the former being in excess, so that even in fattened animals a certain degree of boniness can be observed.

It may also be said that, as a general thing, they are provided with too long and too heavy a head in comparison to the length and volume of the body. They are further frequently too long in the leg, and in but few instances are they well developed about the chest. Yet these shortcomings are the natural result of the simple way of keeping, and of the mode of breeding.

Butter and milk are the chief products of the Dutch farmer. For centuries past he has, in breeding cattle, aimed at a plentiful milk-supply. To obtain this a large udder is required. Now, by continually exciting and early exercising the milk-secreting organ, its development is aided; and as the udder belongs to the genitals, a free supply of blood is necessarily imparted to the balance of the generative organs. In consequence, the hind part of the body receives more blood than the fore part during the period of development, a circumstance which physiologically explains the phenomenon of Dutch cattle, as a rule, showing light fore parts, but well developed hind parts. Particularly is this the case with the most celebrated cattle of Holland, those of the Beemster and Drechterland. Upon these animals the "milk form" has been ingrafted to a higher degree than upon any other breed of cattle known. Nowhere can be found cattle with broader and more prominent hips and hip-bones, while, in consequence of this extraordinary development of the hind parts, the fore parts remain light, letting the fore legs appear high, the chest does not attain sufficient depth, and the shoulders present a bony aspect. This bodily structure, the result of breeding, must be accepted as peculiar to all Dutch cattle. Scientific breeding can easily remove these defects.

As to the question, "whether Dutch dairymen give universal preference to black and white cattle for dairy purposes, or whether this preference is based upon mere fancy," I must answer that the latter is unquestionably the case.

With the great majority of Dutch dairymen, this preference for black and white cattle does exist, although I have met some of the heaviest breeders of the Beemster, Purmer, and of other parts of Holland, who prefer red and white, others silver-gray. In Friesland, the prejudice against red, gray, and white cattle is great. There rarely any other color than black and white is found. But when asked why he prefers black and white, the Frieslander is unable to advance any satisfactory reasons. Some, indeed, contend that red and white cattle attract the heat too much, thereby impairing the quality of milk. However, this assertion being so palpably against all teachings of science, refutation would be superfluous. Dutch scientific agriculturists unanimously agree that this preference for black and white cattle is a mere fancy, handed down from father to son, just as the Dutch farmer prefers a black coat to a red one. In nowise whatever does the black and white color indicate superiority of race.

I must here touch upon the prevailing and erroneous notion of one or the other strain of Dutch cattle being mongrel Holstein breeds. There is no such thing known in Holland. It has been clearly shown that Holstein cattle are the distant but direct offspring of Dutch dairy-stock, and as such approach the latter nearer than any other breed of cattle. Yet, in milk-supply, they are by no means equal. That the Germans entertain the same opinion is evidenced by their heavy importation of Dutch cattle for the purpose of improving their dairy-stock. Dutch cows and choice bulls have of late been shipped to Germany in such large numbers that high Dutch officials, I understand, contemplate the enactment of prohibitory measures against that class of exportations.

Professor Hengeveld has specially been written to upon the subject of Dutch cattle and Holstein cattle. The learned author kindly replied, and I herewith subjoin a translation of his remarks. He says:

"The cattle of the Beemster and Drechterland are not only the best dairy-stock in

the Netherlands, but, as milkers, surpass any breed of cattle in Europe, the celebrated Swiss stock of Bern and Saône not excepted. Necessarily it follows that they are to be preferred to the Holstein, Oldenburg, Breitenburg, and all other so-called marsh or polder breeds of those countries. They yield more abundantly, and their milk is of a richer quality, while, as beef-cattle, they show a less angular frame and finer tissues.

"When transferred to Dutch pastures, the above-named polder breeds improve wonderfully in every respect, although they never equal the native stock either as beef-cattle, or milkers. I may here add that, in former days, the Northmen were in the habit of shipping cattle from the marshes to the rich meadows of Holland for fattening purposes, but at no time did importations take place with a view to the improvement of Dutch stock."

At the present day, cattle importations from those countries to Holland are of rare occurrence. Now and then the Dutch farmer, in order to supply the increasing demand for cattle, effects a foreign purchase; but that he considers the imported inferior to the native stock is evident from the fact that he brings the former to market in preference to the latter. The English demand for Dutch beef-cattle is very heavy.

Of Holstein and Schleswick cattle there are many varieties, how many would be difficult to determine, their distinguishing qualities, as in Holland, depending on the circumstance whether they are bred on the lowlands or on the higher sections of the country. The original lowland breeds, however, have much in common with Dutch cattle as found in the provinces of North Holland and Friesland. The prevailing color of Schleswick cattle is red and white.

Of late *pure* Holstein and Schleswick breeds are more rarely to be found. To improve their natural coarseness of frame, ruggedness and boniness, in short, to enhance their value as beef-cattle, they have within the last twenty years been largely crossed with Durham stock, the massive fat and flesh layers of the latter, and the heavy, broad hind quarters of the former, offering the required elements for such improvement. The crosses thus obtained mature earlier, but generally lose about 30 per cent. in the yield of milk.

In conclusion, permit me to add a description of what a Dutch farmer would call a "*beste koe*," (best cow.) It presents, if such a term may be used in this connection, the Dutch *beau-ideal* of a cow, and I am indebted for it to Mr. W. Sluis, one of the best-informed cattle-breeders of the Beemster:

"A '*beste koe*' must show a finely molded head; large nostrils; thin, transparent horns; a clear, bright eye; thin, large, and not excessively wrinkled eyelids; rose-colored inner membranes of the eye; purely red lachrymal glands; a kind, mild countenance; blue nose; thin neck; free respiration; fine bones; well-formed body, with rather broad hind parts; straight back; long, thin tail; round but moderately bent ribs; developed belly; stout, yet not heavy legs; smooth joints, thin, mellow, movable skin; soft hair; delicately haired broad and drooping udder; four well-formed, dark-colored teats; well-developed milk and blood vessels; vessels on the belly and about the udder to be proportionately broad and vigorous, and of a wen-like swell, and the vessels of the udder and inner hams to spread net-like, the openings through which the milk and blood vessels enter the body to be large and roomy. A cow thus formed is also apt to show a perfect escutcheon."

From Mr. Sluis I also learned why the Dutch farmer prefers black and white to white and black cattle, namely, because it is the general belief that cattle with too much white about them do not endure cold as well as those with which black is the predominating color. As another Dutch notion, I may mention the prejudice entertained against bulls that carry black spots on the pouch, or on the hocks. I failed to be enlightened as to the reason of this prejudice, although at cattle-exhibitions it happened that otherwise unobjectionable animals were rejected by the judges on this account.

And now I bid farewell to the subject. Enough, I trust, has been said in the foregoing pages to assign the proper places, in the world of cattle, to Dutch and Holstein dairy-stock. If my remarks may guide one or the other of American cattle-breeders in the selection of imported dairy-stock, I have not labored in vain.

UNITED STATES CONSULATE, *Amsterdam, August* 9, 1872.

EPIZOOTIC CATARRH.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., February 13, 1873.

SIR: I have the honor to inclose a copy of a memoir of M. Decroix, veterinary-surgeon, barracks of the Celestins, Paris, on the "epizootic catarrh," or distemper, prevailing among the horses of the United States, the original of the treatise having been transmitted to the Honorable Secretary of War, by Wickham Hoffman, esq., of the United States legation at Paris.

The memoir is sent to you with a view to the publication, in your Department report, of such portions as you may deem of sufficient interest and value to agriculturists and stock-raisers, for the benefit of whom, in particular, your report is published.

The receipt of the treatise will be acknowledged by the War Department, and such printed information relative to the disease as can be obtained will be transmitted to M. Decroix in return.

If the files of your office contain any special information on the subject, it is respectfully requested that the same be furnished this Office, in order that it may be communicated to M. Decroix, in care of United States legation at Paris, with the reply of the Honorable Secretary of War.

I am, sir, very respectfully, your obedient servant,

M. C. MEIGS,
Quartermaster-General, Brevet Major-General, U. S. A.

Hon. FREDERICK WATTS,
Commissioner of Agriculture, Washington, D. C.

PARIS, *November* 19, 1872.

SIR: For some time the American and English journals have announced that a serious epizootic has attacked a great number of horses in North America. No scientific description of the malady has yet come to my knowledge; but the symptoms that have been mentioned in the articles that I have read cause me to think that this distemper may be of the same nature as that which severely visited a very large number of the civil and military horses of France during the year 1871.

Supposing this to be the case, I feel it to be a duty and a pleasure, sir, to address to you a succinct account of the distemper that I have treated in my regiment, in order that, if you think proper, it may be transmitted to your Government, for the information of your fellow-citizens.

Will you accept, sir, the expression of my respectful sentiments.

E. DECROIX.

To the UNITED STATES MINISTER at Paris.

HORSE TYPHOID-FEVER, OR GASTRO-INFLAMMATORY EPIZOOTIC.

This malady presents itself under the epizootic form at intervals of ten, fifteen, and twenty years, and attacks great numbers of animals over a vast extent of country.

Principal symptoms.—The affection usually begins by sluggishness, inappetency, drowsiness, and a swelling of the eyelids. Among one-half of the horses attacked the malady has a mild form, and disappears in a few days by a purgative and laxative treatment and a dietetic regimen. When the malady is aggravated, from the second day the mouth is hot and clammy, the respiration and pulsations are accelerated, the mucuses ejected are of a reddish-yellow color, sometimes veined with small red pestilential spots. The gait is stumbling, the loins do not yield to pinching, the hair is easily pulled out, and the skin is sometimes hot, at other times cold. The limbs swell, the posterior members sometimes becoming enormous. The horses are very thirsty, especi-

ally during the summer season. The excrements are often covered with a bed of mucus, in a brownish, infectious liquid. Among some subjects the gastro-intestinal irritation determines a mild colic. Most frequently the thoracic organs are the most severely attacked; the lungs are congested and become more and more inflamed. The pleura secretes a superabundance of water; the pulse is irregular, increasing from 60 to 70; the beatings of the heart are not always very strong, and the metallic sound is rare.

The blood collected in a gauge is black. The separation of the white and black clots of blood is effected in the usual limit of time. The consistency of both is almost healthy. The white clots are smaller than those in the normal state, and are rose-tinted, or sometimes lead-colored. This color is also to be remarked in the serum, the proportion of which does not appear to be the same as in the healthy state. When a cure is performed the symptoms gradually, but slowly, disappear.

In some cases there is a relapse, and then the issue of the distemper is almost always fatal. Cases of passive foundering, of persistent running at the nose, or of rapid emaciation and a return of appetite often predict the glanders, which generally appears in the *ange*, between the lower jaws, by numerous large abscesses. In an unfortunate case respiration becomes more and more difficult the animal falls, struggles a little, and dies. Among certain animals death is preceded for twenty or thirty hours by a weakness of the limbs, which cannot sustain the body, being in a kind of paralytic condition. In the *fulminant* cases the subject appears scarcely indisposed, suddenly falls, and dies in five or ten minutes.

Lesions.—Discolorations and friability of the muscular system; infiltration of the cellular tissue of the limbs, most frequently of the posterior members, sometimes of the lips. Effusion of three or four pints of clear red water in the abdomen. The peritoneum of similar color to the water. The mucus of the small intestine usually of a bright red color, thick, and covered with yellowish, bloody mucuses. The *plaques* of Peyer and the follicles of Brunner (small glands of the intestine) participate in these changes. The mucus of the large intestine is sometimes of a greenish gray or a light slate color. It is easily removed, and in certain cases it presents a dotting of small, scarcely perceptible, ulcerations, especially in the cœcum. The liver is friable and discolored. The mesenteric ganglions are black and congested.

The breast contains from six to ten pints of a reddish, sanguineous water, without albuminous deposits or spurious membranes. The lower portion of one or both lungs is hepatized, like the tissue of the liver, and veined with yellowish albuminous deposits. The pericardium contains from three to five deciliters (.176 of a pint) of water, usually clearer than that in the breast. The intensity and extent of the lesions of the intestines and lungs vary according to the mildness or severity of the affection, the abdominal form or the pectoral, and the more or less rapid progress of the malady. The heart is discolored and friable, as though partly cooked. It presents small, pestilential spots, principally near the fissures, (near the great vessels.) The blood inclosed in the right cavities of the heart, and in the large veinous trunks, is black, pitchy, and incompletely coagulated. The left ventricle incloses a black and white clot. The brain and its envelopes are strongly injected, but there is no notable change in the consistency of the white or gray substances. The other lesions are neither characteristic nor certain, and are of a secondary order.

Denomination.—By the preceding symptoms and lesions the typhoid or gastro-inflammatory, epizootic affection may be easily recognized. In 1825 this distemper visited France with similar ravages to those produced by the epizootic of the United States.

Causes of the malady.—The epizootic attacks old as well as young horses, although the latter, especially if they are fat, may be more proof against it; it spares neither those that labor nor those that repose; those who may be quartered in good or bad stables, or even in the open air. The animals who have eaten the grass of spring, and those who have been deprived of it, cannot escape this distemper. Neither water nor forage can be considered as the cause of the malady. The epizootic appears in consequence of a medical atmospheric constitution that we believe is unknown in its essence, and that disappears after four or five months like the small-pox, cholera, and all other epidemics or epizootics.

Under the influence of this medical constitution, the small sores, the stamping and pulling at the halter, are followed by a considerable swelling. The abscess, when it is formed during the course of the malady, especially when in the lower jaw, suppurates but little in proportion to its size.

Contagion.—In the epizootic distemper that I have had to combat with I have not been able to establish a clear case of contagion. But there are veterinary physicians who pretend to have observed very positive instances of contagion. It is still, however, a matter of doubt; it is always best to separate sick animals, no matter what the malady, from the healthy ones, and this course is more emphatically a proper one in a case of epizootic.

As a disinfectant, chloride of lime possesses very unreliable qualities; *phenique* (car-

bolic) acid, ten grams to a pint of water, is preferable. The best disinfectant, in my opinion, is boiling water thrown upon the racks, mangers, soil, and walls.

Inoculation has been tested, but the result has always been negative; so that if the malady is contagious, it is by way of infection, and not by the transmission of a fixed virus.

Nature and seat of the distemper.—The blood always changes, loses its plasticity, and often filters through the walls of the vessels in order to form, in grave cases, the engorgement of the ecchymosis, or to mingle with the urine, excrements, and native mucus. Here we encounter in greater abundance than in the normal state the elements of bile, the liver being almost always diseased. The fatigues and privations of war do not suffice to account for the malady; the fresh horses having been attacked as the others. The blood being changed, all the organs are more or less affected by it; but the pectoral organs are more frequently and more gravely attacked.

Preventive means.—Avoid as much as possible the contact of the healthy and diseased horses. In the localities where the malady prevails, it is necessary to strengthen the thin, debilitated subjects by tonic powders—gentian powder, quinine, or oak-bark, about 2 ounces a day; on the contrary, it is necessary to administer to the fat, plethoric subjects 2 or 3 ounces of the sulphate of soda, each day, for five or six days. The stables should be kept very clean and well-aired, even when the weather is cold. It is better to leave the horses in the open air or under sheds, than to keep them in badly-ventilated stables. If wearied by excess of labor, make no notable change in their habits.

Treatment.—It is necessary to watch the horses in order to apply the treatment at the outset. The following means have proved most successful with me: First. Between morning and evening an ounce of the essence of turpentine incorporated in a tonic powder; Peruvian bark, gentian, and honey in sufficient quantities to make an electuary. Second. A large sinapism on the breast and abdomen; sometimes the swelling that this provokes is very considerable and spreads rapidly around the poultice; it is then necessary to make incisions, which are cauterized. It is not important to bleed any but the plethoric horses, whose pulses are strong and whose arteries are firm; and then the bleeding should be very moderate; about six pounds, according to the condition of the subject.

Setons may not take the place of sinapisms, as their action is too tardy, but, when the sinapisms do not arrest the progress of the malady, setons, two on each side of the breast, may be useful. If they do not suppurate apply fly-blisters to the flanks, when the abdominal organs are the most severely attacked. In very serious cases, where there are nervous symptoms, as in paralysis, profound coma, or a fit of vertigo, it is important to apply blisters to each side of the neck, upon the loins and breeches. In this case it is necessary to place upon the head a linen or sponge always kept moistened with fresh water.

When colic is consequent to abdominal irritation, the essence of turpentine should be replaced by acetate of ammonia in the electuaries. When there is a fit of coughing and the bronchia is seriously inflamed, the tonic powders and astringents of which we have spoken should be replaced by kermes-mineral and a few grams of laudanum. These medicaments should be employed until there is a notable improvement.

Whatever may be the form of the malady, injections, two or three per day, should be administered.

During the epizootic of 1871, I tested different medicines, phosphoric oil, for instance, in the nervous (siderale) form of the disease, but I obtained no good results. With the *phenique* acid and sulphate of iron the success was doubtful.

Mons. Salle, a military veterinary surgeon, is said to have obtained great success with aloes. I have never tried them and cannot pronounce upon them.

I shall not mention all the secondary means, that should be varied according to the age, temperament, and condition of the patient, and that every veterinary physician who is near the sick horses can best appreciate.

Regimen.—During the acute period the sick horses should always have before them clean water, (a little meal in the water,) into which may be thrown a handful of the sulphate of soda; in case of the swelling of the limbs, the sulphate of soda may be replaced by salts of niter. It is important to give the diseased horses straw of good quality and barley or oat-meal. Carrots are good. As soon as the appetite returns the nourishment must be more substantial; good hay and oats, a little at a time, but frequently, the quantity to be progressively increased. Walking should not be forbidden unless the horse is absolutely unable to walk. The horses should be well groomed and the limbs rubbed vigorously, in order to restore circulation and warmth.

Complications.—When the distemper is serious, it produces a profound change in the whole organism; convalescence is long, and during this period there sometimes appears an inflammation of the synovial membrane of the fetlock-joints, (the treatment of which is known,) but what is more to be dreaded is the appearance of the glanders. In view of this, the horses should be carefully inspected.

I am convinced that, connected with the American epizootic, whatever may have

been its actual character, there were more glandered horses than in ordinary years. It is therefore necessary to guard against that disease by slaughtering the animals as promptly as possible in order to avoid contagion.

Number of horses attacked.

Effective number	612
Number of horses attacked so seriously as to be sent to the infirmary	165
Number cured	144
Number died	21
Number lightly attacked and put upon a proper regimen, in stable, about	100
Total attacked	265

In many other localities the proportion was about the same.

Duration.—The epizoonic began about the 1st of June, was at its height at the beginning of July, and disappeared at the end of September.

The duration for each horse was variable; ten or twelve days in mild cases, and thirty or forty days in serious cases. Where the issue was fatal, death usually occurred from the seventh to the ninth day, sometimes much sooner in fulminant cases, and later in cases of complications.

Such, Mr. Ambassador, is the relation that, in the interest of your fellow-citizens, I believe it to be my duty to request you to make known to your Government. If you should desire further information I should be happy to communicate it to you.

I should be pleased if, in return, you would procure an account of the distemper from some American professional veterinary-surgeon, and transmit to me a copy.

E. DECROIX,
Veterinary-Surgeon in Chief to the Republican Guard,
Barracks of the Celestins, Paris.

FISH-CULTURE.

The following communication has been received by the Commissioner from Hon. Robert B. Roosevelt, of New York City:

SIR: Now that the artificial production and cultivation of fish has taken an established position among the industries of the world, and especially of this nation, a thorough investigation of its fundamental principles is a matter of public interest. That it has passed from the realm of theory and empiricism into that of permanence and success is well proved by the existence of numerous fish-breeding establishments carried on for profit, and the creation of fishery-commissions by the legislatures of most of the older States of the Union. It is true that the principal varieties of the inhabitants of the aqueous element cannot be "cabined, cribbed, confined," cannot become the subjects of special property, and must be allowed to roam from one spot to another, passing under different legal, without actually coming within any permanent, jurisdictions. But at least one sort of fish has become a merchantable commodity, and is bred, raised, and sold precisely as sheep or cows or horses are bred, raised, and sold, and has a fixed marketable value, with a demand generally exceeding the supply. There are not less than fifty professional breeders of trout in this country, all making a living mainly or wholly from this employment, and several receiving large incomes. They keep mature fish in restricted and controllable limits, supervise their gestation and parturition, attend to the proper impregnation of the eggs by natural or artificial means, protect and guard the ova while hatching, assist the young when first born, and when encumbered with the umbilical sac they are unable to take care of themselves, and finally feed them when the time arrives for them to receive nourishment, until they can be distributed in the localities where they are needed. This is no temporary or fanciful occupation, but a regular business. So with the public attempts to increase the supply of those sorts of fish which inhabit large rivers and lakes, and may be taken by any member of the community, or a number of different proprietors of fishing-rights, or which are anadromous and yearly descend into the ocean, the common property of the world. These efforts, under the legislative encouragement of the several States, have been uniformly successful to a degree fully commensurate with the time and money expended, and have entirely established the proposition that fish can be cultivated as easily and profitably—it might seem hyperbolus to say more so—as grain, fruits, or vegetables. As an instance of this, reference can be made to the Connecticut, in which

some thirty millions of young shad were artificially hatched in the year 1868, and, as a consequence, the yield at the proper time was made larger than it had been since 1802; or to the Hudson, in which ten millions of the same fish are hatched yearly, and the fishery is being rapidly restored, although it had run down until it was on the point of being abandoned.

There are three facts which at once arrest the attention of the investigator into the art of pisciculture. In the first place, he finds that vast tracts of water are either almost depopulated or wholly bare of fish; not a reader of these words but can mention a dozen ponds or brooks which are simply stripped of all edible living creatures, while in other rivers or lakes the fishing has become so poor that it cannot be profitably followed for its yield, and is abandoned as a source of amusement. And yet the experience of older countries and the evidence of experts prove that an acre of water can be made far more remunerative than an acre of land. Were a similar number of miles square of valuable land equally neglected public attention would be aroused and statesmen would be investigating the causes of such an anomaly. In a portion of France crops of grain or grass are regularly alternated with crops of fish—such as eels—and the latter are altogether the most remunerative, and yet in this country the nation's boundless heritage of water is left unimproved. Instead of increased development fisheries are being everywhere exhausted and waters everywhere depopulated. Efforts are put forth on all hands to make two blades of grass grow where one grew before, and the successful inventor is called a public benefactor, while ignorance, neglect, and perversity are permitted to destroy a supply of food but little, if any, less important than the most valuable single production of the earth. Many of these streams at present deserted were once teeming with life. When Hendrich Hudson first ascended the river called by his name, the shad, which he mistook for salmon, were so numerous that he makes mention again and again of the "great stores of salmon" he encountered; and when the country was first settled every brook and rivulet could furnish in an hour its abundant meal of trout, bass, or perch. The rivers have not changed, the waters have not become unwholesome; except a few incidental localities where pernicious employments are carried on, fish could live, increase, and multiply, as freely and readily now as heretofore. Here is a fit object for the attention of the learned and the care of the law-maker. There is no better food than that of fish, and so long as the words "the poor ye have always with you," hold good, it is a duty to cultivate all the means of supporting human life that nature has placed within the reach of man. It is a sin to neglect the water while so many have all they can do to draw a meager living from the land.

The next point that the investigator will note with wonder is the almost infinite productiveness of fish. Maize yields its four or five hundred grains for one, wheat and oats far less, and other agricultural products in proportion, but the cod and herring lay millions of eggs each, while the shad and striped-bass, *Labrax lineatus*, produce as many hundreds of thousands. One of the least productive varieties is that of the *Salmonidæ*, and yet that contains two thousand eggs to every pound-weight of the parent; while the black-bass, *Grystes nigricans*, although comparatively not prolific, guards its eggs till they hatch and the young until they can care for themselves. This fecundity is startling and leads to curious conclusions. It had some wise purpose under the kind laws of the Creator of all things, and yet had it been unobstructed in its operations it would have brought about disastrous consequences. Had all the *ova* of the cod, and hake, and haddock hatched, the sea would have been a mass of fish, and foul with their putrefying carcasses; had there been no counterpoise, no compensating law of restraint, the pure element that is needed to sustain man's life would have been defiled and the human race could never have existed on this planet. But there were proper and effectual balance-wheels that entirely obviated such dangers. The enemies to young fish life are almost as numerous as the fish themselves; older fish feed on the *ova* and the fry, devouring both in incalculable numbers; bugs, *animacula*, the *pupæ* of water-flies and myriads of insects prey upon the immature spawn, while much of it gets covered with mud or silt, is never impregnated, or fails for one of a thousand reasons to hatch. So the yield is limited, and after it has reached a certain point never varies from that without some extraneous disturbing cause, a cause which usually comes from the interference of man. Were the human race extinct there would just be exactly so many fish in the seas and the lakes and the rivers, no more, no less, and rendered invariable by the unvarying law of variations, the unchanging rule of circumstances. So they are found to be in all new countries, and once were here. But man steps in, he takes the kinds he likes for food, he neglects the worthless and inedible, he pays no heed to minute enemies, and leaves the foes of the very sorts he appropriates to increase and multiply without limit. What is the result? Precisely what is seen in all the inland waters of this continent, and what will soon be apparent in the adjoining sea. The fish have disappeared, and their worthless foes either occupy their place or are themselves dying for want of food.

Thirdly, the investigator will observe that of all sorts of human food none is produced so cheaply as that of fish. It costs nothing for manure, it needs no tillage it

requires only the harvest, or, under artificial cultivation, the seed-time as well. The expense of the harvest, too, depends upon the amount of the yield; for, were fish as abundant as they should be, it would be but trifling. A shad, no longer than the first joint of one's little finger, and not much thicker than a pin, is turned loose in the head-waters of some river, feebly it floats toward the ocean with the current, feeding because it grows, but on food wholly invisible to the eye of man even assisted by the microscope of science. Slowly it is converting the worthless into the valuable. In a few months it is an active, vigorous little fish of three or four inches length. Then it adventures out into the ocean, the vast store-house of incalculable amounts of its food; *animalcula*, suspended in mud-water thick as motes in the sun's rays; *crustacea*, on the bottom, only less abundant than the grains of sand; and *conferva*, floating about in masses an acre wide. It grows and grows, assimilating more valueless substances and turning them to man's service, and at last it returns, of full size, in splendid condition, fit for the fisherman's net, and worthy to grace the table of the epicure. It left its birth-place a poor, puny, worthless thing, of scarcely an appreciable weight; it returns a three or four or five pounds weight of edible delicacy, not to be surpassed in strength-giving or gastronomic qualities. It demands no care, and draws but little from the world's stock of food or food-making substances; the ox devours tons of grass, which has cost much labor and required valuable manure, ere he is fit for the butcher; but the shad prepares himself for the fisherman by his own exertions, and then comes voluntarily to the net when he is fit to kill. The warm-blooded animals are expensive to raise; they are active, full of motion and heat, and waste much of their food in assimilating the rest; but fish are cold blooded, dull, and quiet, rarely moving unless disturbed, and lying, hour after hour, in one position, unless tempted out to pounce upon their prey. They void but a trivial proportion of what they consume, and their active digestion quickly converts the greater part of it into their own flesh, yet medical investigations establish that fish-food is more nutritive than meat, and is especially adapted to the sustenance of the brain, marrow, and bones, as it contains large quantities of phosphorous. In every point of view, then, it is cheaper; and nature would seem to have expressly kept this reserve until the earth should be so crowded with people that man could no longer find in it a means of support, and should be forced to look for maintenance to the waters which once covered the world, and are still two-thirds of its extent. This provision seems doubly probable, when it is remembered that the principal dangers to fish-life exist in the ova state, and that it is in precisely that stage that man's assistance can be given and is of the greatest use.

UNITED STATES COMMISSION OF FISH AND FISHERIES.

Professor Spencer F. Baird, of the Smithsonian Institution, acting as Commissioner of Fish and Fisheries under act of Congress approved February 9, 1871, has made his first report, which has just been printed for general circulation. This report embraces his investigations concerning the condition of the sea-fisheries of the south coast of New England, in 1871 and 1872. It will be remembered that the act creating this commission was passed in view of the reiterated assertions that the most valuable food-fishes of the coast and the lakes of the United States were rapidly diminishing in number, "to the public injury, and so as to materially affect the interests of trade and commerce." The commissioner was charged with the duty of prosecuting his inquiries with reference to "ascertaining whether any, and what diminution in the number of the food-fishes of the coast and the lakes of the United States has taken place; and, if so, to what causes the same is due; and also whether any and what protective, prohibitory, or precautionary measures should be adopted in the premises."

It is a matter of surprise that, notwithstanding the material importance of the fisheries more immediately to the States along the coasts, and in full view of the fact that the fish-supply was becoming less reliable, and, indeed, in some localities failing almost entirely, no official investigation or inquiries were set on foot until as late as 1869–'70, when petitions aroused the attention of the legislatures of Massachusetts and Rhode Island. But the reports of committees of investigation were so utterly at variance as to conclusions and recommendations, that anything like harmony and concurrence of action through statistical regula-

tions was little to be hoped for. Not without reason, it was judged that the investigations of a scientific commission, acting under the authority of the General Government, and unembarrassed by local considerations, would carry weight, and its enlightened recommendations dispose those immediately concerned in the prosperity of the food-fisheries to co-operate readily in the plans proposed for their preservation and improvement.

Professor Baird began his investigations in the summer of 1871, at Wood's Hole, Massachusetts, where the large number of "pounds" afforded material for inquiry. Simultaneously, investigations were being made off the coast of North Carolina, under the direction of Dr. C. H. Yarwood, United States Army, and by a deputy commissioner whose operations were to be confined to the great lakes. The latter, during the season of 1871, visited every pound and gill-net station on Lake Michigan, collecting a body of valuable information which will appear in another report. Investigations, taking in a greater extension of seacoast, were continued in 1872, and the present report has reference in its data and conclusions to the south side of New England, especially that portion of it extending from Point Judith on the west, to Monamoy Point on the east, including Narragansett Bay, Vineyard Sound, Buzzard's Bay, Martha's Vineyard, and Nantucket. In view of inquiries made upon these grounds, covering two seasons, Professor Baird has no hesitation in stating that the fact of an alarming decrease of the shore-fisheries has been clearly established by his own investigations, as well as by evidence of those whose testimony was taken upon the subject. He reviews in order and at length the reasons ascribed to account for the decrease which, as commonly given, are:

1. The decrease or disappearance of the food upon which the fish subsist, necessitating their departure to other localities.

2. A change of location, either entirely capricious or induced by the necessity of looking for food elsewhere, as just referred to.

3. Epidemic diseases, or peculiar atmospheric agencies, such as heat, cold, &c.

4. Destruction by other fishes.

5. The agencies of man; this being manifested either in the pollution of the water by the discharge into it of the refuse of manufactories, &c., or by excessive over-fishing, or the use of improper apparatus.

The validity of the assumption of a diminution of food is denied in the most positive terms. That change of abode on the part of the fishes as a cause of decrease has not been substantiated by facts. Where no positive cause for sudden disappearance of fish in quantity can be given it is often ascribed to diseases or to atmospheric agencies. The ravages of predaceous fishes, of the blue-fish particularly, are a leading cause of the diminution of the fish-catch. Of the blue-fish, Professor Baird ascertained by careful inquiry that about one million and a quarter could be estimated as the number captured in Vineyard Sound, and on the coast from Monamoy Point, through Long Island Sound, and sent to the market in 1871. Judging, from the character of the fish, that not one in a hundred is taken, he admits the presence in those waters of 100,000,000 blue-fish. Their habits show that they each destroy at least twenty young fish per day, thus showing an enormous aggregate destruction. He says:

We all know that fish-spawn and fish in different stages of growth constitute the principal source of food to other fishes in the sea, and that the great proportion of fishes devoured are of tender age. The blue-fish, however, will often attack species but little less than itself, and the 100,000,000 referred to probably destroy fishes of two or three ounces and upwards; that is to say, those that have passed the ordinary perils of

early life, and have a fair chance to reach maturity. Therefore, if 12,000,000,000 are eaten, the number destroyed off the New England coast in a season of one hundred and twenty to one hundred and fifty days can be easily estimated.

Notwithstanding this great destruction by the blue-fish, Professor Baird is confirmed in his impression, by careful observation, that to the concurrent action of man is due in larger proportion the decrease of fish, and in some grounds a danger of practical extermination. The tendency of the methods employed, in many cases, is obviously in the direction of a comparative diminution of fish-supplies. The general conclusions of Professor Baird, covering the results of two seasons of patient and pains-taking investigations, will be read with interest.

I. The alleged decrease in the number of food-fishes in these waters within the past few years has been fully substantiated.

II. The shore-fishes have been decreasing during the past twenty years, gradually at first, but much more abruptly from the year 1865; the reduction in the year 1871 being so great as entirely to prevent any successful summer-fishing with the hook and line, and leaving to the traps and pounds the burden of supplying the markets. This statement applies also, but perhaps to a certain extent, to the blue-fish. The decrease in their numbers first manifested itself about ten years ago, and is going on quite rapidly until now.

III. This period of decrease represents the time during which the traps and pounds have been well established, their operations increasing year by year, and their catch, especially in the early spring, being always very great.

IV. In 1871 and 1872 the decrease in the number of fish has been so great as to reduce very largely the profit formerly derived by the traps.

V. The appearance, in 1871, of an unusually large number of young fish spawned in 1870, is a phenomenon only to be explained by the probable escape of a larger number of breeding-fish than usual during the previous season, an abrupt decrease in the ravages of blue-fish and other species, or else by a spontaneous movement northward of newly-hatched fish that ordinarily would have remained on a more southern coast. While these fish will, probably, for several years, constitute a marked feature in the fisheries, there is no evidence of the existence of a second crop of young fish corresponding to the one in question.

VI. The decrease of the fish may be considered as due to the combined action of the fish-pounds or weirs, and the blue-fish; the former destroying a very large percentage of the spawning fish before they have deposited their eggs, and the latter devouring immense numbers of young fish after they have passed the ordinary perils of immaturity.

VII. There are no means at our command for destroying the blue-fish, nor would it be desirable to do this, in view of their value as an article of food. The alternative is to regulate the action of the pounds so as to prevent the destruction of fish during the spawning-season.

VIII. The quickest remedy would be the absolute abolition of the traps and pounds. This, however, would be a harsh measure, and their proper regulation will probably answer the purpose of restoring the supply, although a greater number of years will be required. Such regulation may consist either in prohibiting the use of traps or pounds during the entire season of the spawning of the fish, or for a certain number of days in each week during that season.

IX. As the principal profit of the pounds is derived from the catch of fish during the spawning-season, it will probably be sufficient to try the experiment of prohibition of the use of nets from Friday night until

Monday morning of each week of the spawning-season, and after that no restriction need be imposed.

X. It is desirable that the regulation for a close time during each week be passed by the several States; and if this cannot be effected, then the General Government should enact absolute prohibition, or at least during the spawning-season, as it possesses no officers who could exercise the supervision required to enforce the partial closure, or before whom complaints could be entered and the penalty exacted.

XI. Any marked increase in the number of the shore-fishes, resulting from their protection during the spawning-season, will probably tend to restore the blue-fish to their original numbers.

XII. As there is reason to believe that scup, and to a less degree other shore-fishes, as well as blue-fish, have several times disappeared at intervals to a greater or less extent, within the historic period of New England, we cannot be certain that the use of traps and pounds within the last ten years has actually produced the scarcity complained of. The fact, however, that these engines do destroy the spawning-fish in so great numbers renders it very probable that they exercise a decided influence. No vested interest or right will suffer by the experiment of regulating the period of their use, as we have attempted to show that a better price will be obtained from a smaller number of fish, by preventing the glutting of the market, and the consequent waste of so perishable an article as fresh fish.

XIII. A feeling of bitterness entertained by the line fisherman and the general public against traps and pounds, and those who own and profit by them, will, in a measure, be allayed if the experiment of regulation and restriction be tried, at least for a few years.

FOREIGN STATISTICS.

The following statements are from a translation of a recent report of the French minister of the interior:

CREATION OF A BUREAU OF STATISTICS IN AUSTRIA.—A new bureau, in the department of commerce, called the bureau of statistics, has been organized in Austria. The importance of the science of statistics is generally recognized. Austrian economists have long been pressing this matter upon the government and the public. Says the former minister of commerce, a well known economist, Doctor Schaeeffle, "Official statistics should be extended as a network of observations over the whole country, and consecrate its best efforts to the study of social movement." The new measure will fill a seriously felt blank. It is true there was in existence a central commission of statistics, but its labors wanted method and unity. Furthermore, its activity was limited to the interior, whereas comparative statistics is the only system of value or utility. The department of industrial statistics is entirely wanting in Austria, which is especially to be regretted at the opening of the universal exposition. The department of commercial statistics was better organized, but publications concerning it rarely appeared at useful periods, and were too tardily given to the public. Every three months the minister of commerce announced, in a weekly review, *The Austria*, the results of the commercial movement; the Central Commission of Statistics published annual reports. But sometimes these abstracts did not agree with each other. Unity of direction was manifestly deficient. The new organization takes cognizance of this difficulty.

Since 1864 a greater regularity is observable in this service. In the first half of the century, statistical tables, giving abstracts of commerce, were ordinarily published at intervals of about two and a half years or more; thus the commerce of 1842 was not officially known till October, 1845. Things have since changed, and the official table of 1870 was published in December, 1871, or about twelve months after the close of the year. This delay will be still further reduced under the new policy.

Another question should attract the attention of governments. Hitherto European governments have not adopted a uniform statistical system. Would it not be useful to adopt a common base of operations? It is only by unity of aim and effort that nations will make of statistics a practical science, securing a comparison between productive forces.

THE METRIC SYSTEM IN AUSTRIA.—A law of July 23, 1871, introduced the metric system into Austria. The standard of measure is a rod enclosed in glass in possession of the Austrian government, which, at the temperature of melting ice, is equal to 999.99764 millimeters of the prototype meter deposited at Paris. The standard of the kilogram is a kilogram of crystal, the weight of which, *in vacuo*, is equal to 999.9978 of the prototype kilograms of Paris. The new system of weights and measures will be used in trade after the 1st of January, 1873; it will be obligatory and exclusive after January 1, 1876. The weights and measures hitherto used in Austria will bear the following values in terms of the metric system:

Measures of length.—A toise of Vienna equals 1.896184 meters; a foot of Vienna, 0.316084 meter; an ell of Vienna, 0.777558 meter; one postal mile, 7.585936 meters; one span, 10.53602 centimeters.

Measures of surface.—A square myriameter equals 1.737727 square miles; a square toise, 3.596652 square meters; a square foot, 0.099907 square meter; a *joch* of Lower Austria, 57.51612 ares; an Austrian square mile, 0.5754642 myriameter.

Measures of capacity.—A cubic meter equals 0.146606 cubic toise; a cubic meter, 31.66695 cubic feet; a cubic toise, 6.820092 cubic meters; a cubic foot, 0.03157867 cubic meter.

Dry measures.—A hectoliter equals 1.626356 Viennese setiers; a liter, 0.01626365 Viennese setier; a Viennese setier, 0.6148682 hectoliter, or 61.48652 liters.

Liquid measures.—A hectoliter equals 1,767129 eimers; a liter, 0.07068515 mass; a Viennese eimer, 0.565890 hectoliter; a Viennese mass, 1.414724 liters.

Measures of weight.—A kilogram equals 1 pound 25.0137 ounces; a decagram, 0.571367 Austrian ounce; a ton, 1,785.523 pounds; a kilogram, 2 pounds of the customs, or 2.380697 pounds, apothecaries' weight, or 3.562298 silver marks. A gram equals 0.286449 ducat of gold, or 4.855090 karats of Vienna, or 0.06 postal ounce. A Vienna pound equals 0.560060 kilogram. A quintal, 56.0060 kilograms; an ounce, 1.750187 decagrams; a quintal of the customs, 50 kilograms; a pound of the customs, 0.5 kilogram; a pound, apothecaries' weight, 0.420045 kilogram; a Vienna silver mark, 0.280668 kilogram; a gold ducat, 3.490896 grams; a Vienna karat, 0.205969 gram; a postal ounce, 16.666667 grams.

FOREIGN COMMERCE OF AUSTRIA.—During the semi-decade, 1867–'71, Austrian commerce was remarkably progressive. The course of business arrested by the military operations of 1866 was revived with new force. That year may be considered as the starting-point of an upward movement, the importance of which may be seen from the following figures: The total foreign trade of Austria, in 1871, amounted to 1,147-

218 florins, the Austrian florin being about equal to half an American dollar. Of this aggregate 583,540,000 florins represented the imports, and 561,678,000 florins the export trade. These amounts were nearly double those of 1866, of which the imports were 245,168 florins, the exports 380,406,000 florins, and the total 625,574,000 florins. The heavy balance of export trade gradually declined till in 1870 the surplus of imports amounted to nearly 50,000,000 florins, the import balance of 1871 being nearly 22,000,000. The specie movement of the semi-decade exhibits the same expansion. In 1866, the imports of precious metals amounted to 27,250,000 florins, and the exports to 50,937,000; during 1871 the imports were 59,803,000 florins, and the exports 63,108,000, showing a decided tendency toward equalization.

A more marked development is observable from 1867 to 1868 than in the following year. The reason of this difference is found in the exceptional export of Hungarian cereals during 1868, which was not maintained during 1869. Importation of rough metals was greatly extended during 1867, in consequence of the impulse given to railroads. A great part of the supply of 1869 was imported in 1868.

The imports of agricultural products and manufactures thereof during 1871 embraced the following, viz: Colonial and tropical products, 29,112,000 florins; tobacco, 13,256,000 florins; grains and fruits, 24,401,000 florins; animals, 20,173,000 florins; animal products, 18,700,000 florins; seeds and oils, 15,477,000 florins; liquors and provisions, 3,848,000 florins; textile materials, 112,357,000 florins; yarns, 39,929,000 florins; tissues of all sorts, 62,811,000 florins; leather and skins, 19,836,000 florins; total, 359,900,000 florins.

The exports of agricultural matter and its manufactures in 1871 embraced the following: Colonial and tropical produce, 26,340,000 florins; tobacco, 13,871,000 florins; grains and fruits, 86,815,000 florins; animals, 10,881,000 florins; animal products, 10,921,000 florins; seeds and oils, 7,757,000 florins; liquors and provisions, 6,483,000 florins; textile materials, 45,962,000 florins; yarn, 11,427,000 florins; tissues of all sorts, 61,327,000 florins; leather and skins, 18,996,000 florins; total, 300,240,000 florins. Nearly all these exports exhibit a marked increase since 1866. Less textile raw-material was exported, but the deficiency has been made good by the increased export of yarns and fabrics. This indicates a very healthy condition of textile industry, which is now working up an increased proportion of native raw-material. Colonial and tropical products manifest a marked increase of export.

DALMATIAN AGRICULTURE.—Dalmatia is an Austrian province stretching along the northeast coast of the Adriatic two hundred and nine miles, with a breadth varying from two to fifty miles. Its population numbers 220,169 males and 222,627 females; total, 442,796. The mass of the people are Serb-Croat, about 20,000 Italians being domiciled in the land. The dominant religion is Roman Catholic. The land-surface embraces 1,000,000 arpents of free pasture, 479,478 arpents of woodland, 200,000 arpents of vineyards, 22,264 arpents of meadows and gardens, 26,934 arpents of olive groves; the remainder of its agricultural area is devoted to cereal productions. The vine and the olive flourish along the coast when the thermometer does not fall below 5° (R.) below zero. The meadows and grain-fields occupy the higher lands, and extend back to the frontiers of Turkey.

SUGAR INDUSTRY IN AUSTRIA.—According to the latest reports, there are in Austria two hundred and thirty-six beet-sugar factories, of which one hundred and sixty are in Bohemia, forty-nine in Moravia, eleven in

Silesia, eight in Lower Austria, six in Gallicia, and two in Styria. Adding to these figures twenty-six factories in Hungary, and the total becomes two hundred and sixty-two. Of the above seven are exclusively refineries, and about two-fifths, or one hundred, are worked upon shares. Ten new factories are in process of construction. The number of factories in Austria increased in two years eighty-one, or 52 per cent.; in Hungary it remains stationary.

Wool industry in Hungary—Kinds, qualities, production.—Pesth is the center of the wool-trade of Hungary, with the exception of some western districts which export a portion of their products directly to Vienna. Hungarian wools, which are the basis of important transactions in the Pesth market, are of various sorts.

1. *Merinos*, which come mostly from the great basin of the Theiss. These merinos are of medium quality, and are divided into two distinct classes; *a*, fleeces shorn twice a year, in April and May and in August and September; *b*, fleeces shorn but once a year, some time in June.

2. Fleeces known as *Cigaja* and *Zakel*. These are produced by two other kinds of sheep found in Transylvania, in the Banat, and in Sclavonia. This wool is long, brilliant, and very harsh; its fibers attain a length of thirty centimeters. It is especially used as a combing wool, and for the fabrication of heavy tissues. Its range is entirely independent of that of the merinos.

3. Lastly, a fleece intermediate between the two preceding is furnished by a cross-bred sheep raised in Transylvania, the Banat, and Sclavonia.

Production.—Hungary produces about 20,000,000 kilograms of fleeces. The larger portion of the clip is sent to Pesth by traders, and not by producers, who are in the habit of selling their products in advance of shearing and of receiving a portion of the price at the conclusion of the bargain. The fleeces, washed before shearing, arrive at the market packed in sheets of rough canvas.

Business habits and usages of the Pesth bourse.—Transactions are usually for cash, with a discount of 2 per cent. Each contract, however, may vary its stipulations according to agreement. The seller promises to deliver his wool well washed. If for any cause the washing is imperfect he owes the purchaser an indemnity. The odds and ends are not packed with the fleeces, but receive the same price as the rest of the wool.

Frauds against which dealers must protect themselves.—These are principally of two sorts: first, they must ascertain whether the wool has been stored in cellars in order to enhance its weight; second, they must see that the staple is not charged with sand from the plains between Pesth and Szegedin. This sand is very heavy and very fine, disappearing only after the most thorough washing. Its presence is not appreciable to an inexperienced eye.

Channels of exportation.—The greater part of the wool marketed at Pesth, nearly 12,000,000 kilograms, is purchased by the cloth manufactures of Brun and Reichenberg. The combing wool mills of Wolsau and Pesth and the mills of Bohemia consume about 2,000,000 kilograms. During later years Hungary has been sending to France from 1,250,000 to 1,500,000 kilograms of combing wools, and from 500,000 to 750,000 kilograms of clothing wools per annum. Germany and England make about equal demands on the Pesth wool-market. Considerable importations from Australia and La Plata into England, and thence into continental Europe, have reduced the market-prices at Pesth, and foreign transactions have greatly declined. On the other hand, since the compro-

mise of 1866, the industrial movement has greatly progressed. The later yields have enabled Hungary to increase her demand for the manufactures of Europe, and to give the first impulse to her own wool industry.

Manufactories established at Pesth.—Two manufactories, placed in operation in 1869, present a special interest; of these one has for its principal aim to favor the exportation of wool by reducing its expense of transportation; the other is a real industrial establishment presenting a solid interest by its excellent installation, the goodness of its fabrics, and the financial results already achieved.

The first is known under the name of the *Wollwasch-Fabrik*. It receives wool in grease directly from producers, which it sorts, washes, and sells on account of the proprietors, charging a certain price for handling and small commission. It is at once an industrial and a commercial house. This combination reduces the expense of transport 70 per cent. The *Wollwasch Fabrik* can wash 1,300,000 kilograms of wools per annum. Unfortunately only wools of medium quality can be economically subjected to this mechanical washing; the alkalies employed in washing and the mechanical processes to some extent knot and felt the fiber.

The second, known as the *Erste Ungarische Kammgarn-Spinnerei Gesellschaft*, is a complete establishment, embracing apparatus for washing, carding, combing, spinning, twisting and even a dye-works which can color the most diverse shades, to the extent of 1,000 kilograms of yarn per day. A weaving-factory has been added, which already contains fifty cashmere looms. A capital of 600,000 florins, (about $300,000,) divided into 3,000 shares of 200 florins ($100) each, under the skillful and conscientious direction of a Frenchman, M. Émile Lepaulle, an old pupil of the *École des arts et des métiers*, of Chalons, is sufficient for all the purposes of purchase of ground, construction, and installation. With the exceptions of the motive-powers and the transmissions of movements, all the apparatus, assortments of cards, automatic spinning-jennies, apparatus for combing, apparatus for twisting, came from the factories of the best French constructors, MM. Nicholas Schlumberger, Stehelin & Co., Mord, and others. The looms are of the system of Hodgson, of Bradford, England. The manufactory contains 12,000 spindles, of which 2,000 are adapted to the long wools of Cigaja and of Wallachia, and 1,000 to merino wools. It works up 560,000 kilograms of wools, produces 260,000 kilograms of yarns, which are sold almost entirely in the country.

In six months of fabrication the *Kammgarn-Spinnerei* realized a profit of 25 per cent. upon its capital. These profits are to be converted into capital in order to extend the industry. The labor of the factory is exclusively Hungarian, with the exception of the foremen, who have all been drawn from the factories of Alsace. The establishment employs one hundred and fifty workmen and two hundred and fifty women, who work by the piece. The men earn from 2 francs 75 centimes to 6 francs 50 centimes, and the women from 1 franc 50 centimes to 3 francs per day of twelve hours. The raw material employed has a value of 5 to 6 francs per kilogram for *merino*, and from 4 to 5 francs for *Cigajo*. The products fabricated of merino are worth 11 francs per kilogram; the other is estimated at 8 francs 30 centimes. The wool is not subject to any import-duties in Hungary, while manufactures analogous to those of the *Kammgarn-Spinnerei* are protected by a duty of 8 florins (20 francs or $4) per hundred kilograms. Already the *Kammgarn-Spinnerei* is not equal to local wants; the increase of wealth in Hungary will certainly bring about a greater consumption of this product purchased almost exclusively by the middle and wealthy classes. Ultimately the importance of the market for raw material, commercial relations and media of communication, daily

augmenting, will, some day, permit the Hungarians to seek connections with the Danubian provinces, and perhaps to extend them even as far as Constantinople.

FACTS FROM VARIOUS SOURCES.

LARGE PROFITS FROM SMALL FARMS.—We have received from the corresponding secretary of the Farmers' Club at Farmingdale, Queens County, New York, a copy of a paper read before it by its president, J. W. DeLee Ree, the design of which is to show "how a living is made on a twenty-acre farm on Long Island." The steps by which the conclusion is reached are here given in a condensed form. It being premised that small farms prevail on the island, thirty acres being considered enough for a farmer to carry on, with the help of one or two boys, and that the larger farms prove to be less profitable than the smaller in proportion to the acreage, it is represented that ordinarily farms of twenty acres, in the central part of the Island, thirty to forty miles from New York, are worked in the manner and with the results following. When practicable, such a farm is divided into seven parts, six of which are three-acre lots for tillage, and the seventh is occupied with the buildings, poultry yard, kitchen-garden, and an orchard of about one hundred and fifty apple and pear trees. Other fruit-trees, such as cherry, are planted by the road-side, and so answer the triple purpose of ornament, shade, and fruit. Grass being the great desideratum, a good farmer does not rest satisfied until he makes his fields yield at the rate of two tons to the acre the first year, without much shrinkage for the next two years. With this view rotation is practiced, and usually a six-year course, in the following order. The first year, corn is planted on sod ground, with manure in the hill; the second roots, sufficiently manured to be followed by wheat the third, and by grass the three succeeding. Half the eighteen acres is thus kept in grass, three being broken up each spring, and three seeded down each fall. But, if one acre is planted with (say early rose) potatoes, they can be harvested in season to sow the same by the first of August with turnips, yielding four hundred to six hundred bushels. If the farm contains twenty-three acres, another lot and another year is added, corn being planted two years in succession; if twenty-six acres, grass-seed is sown when the corn receives its last dressing the second year; the field is grazed one year, then roots, wheat, and grass follow. On a twenty-acre farm, tilled as above described, the crops, well cared for, will average about as follows: three acres of corn, 55 bushels per acre, at 90 cents per bushel, $148.50; three acres of potatoes, (or an equivalent in roots,) 200 bushels per acre, at 65 cents per bushel, $390; three acres of wheat, 25 bushels per acre, at $1.75 per bushel, $131.25; nine acres of grass, $1\frac{3}{4}$ tons per acre, at $20 per ton, $300; profit on two hundred hens kept for eggs, $1.50 each, $300; on two cows, $75 each, $150; on orchard, $2 per tree, $300; total, $1,719.75. Outgoes: for board of team, at $1 per day, $365; for manure purchased, $200; interest on farm and buildings, valued at $3,000, and stock and tools, valued at $1,000, at 7 per cent., $280; taxes, $20; total, $865. This deducted from $1,719.75 leaves a net profit of $854.75. Add to this the profits from the garden, the bees, the pigs, &c., and it will give a clear income of about $18 per week the year round. That is, the judicious and industrious cultivator of a twenty-acre farm receives a salary equal to that of a first-class mechanic, besides the advantages of outdoor instead of indoor labor, of great variety instead of monotonous uniformity in his work, and espe-

cially of being his own master, which, to a person of independent, self-reliant spirit, is of no small account. It may be thought that, all the hay being reckoned at market-value, the profit on the cows is put too high; but the straw and corn fodder, (or their avails,) and what turnips can be raised after a crop of early potatoes, will afford abundant feed for two cows through the winter. There is no cheaper way to keep cows in first-rate order than to raise turnips enough to feed one bushel per day to each through the winter. On some small farms as many as five cows are kept. In that case less hay is cut, and what is is chiefly fed out. Consequently more manure is made and less bought. But the more cows the more work in the house, and as the usual aim is to get along without outside help, the sources from which profits are sought on the farm are often regulated by the state of the family in respect to the relative amount of outdoor and indoor help it affords. The fact is not overlooked that all small farms do not yield a profit equal to the above estimate; while some are made to exceed it, others are made only to yield a bare subsistence. But in the latter case the failure can always be traced either to a soil of poorer than average quality, or to a lack of intelligence and aptitude for acquiring it, or a lack of sound judgment, or of industry, or some similar cause.

EXPERIMENTS IN POTATO CULTIVATION.—The following statement is received from J. V. H. Scovill, of Paris, Oneida County, New York:

Many practice the habit of selecting only small potatoes for seed, reserving those that are merchantable for sale. Others plant medium-sized potatoes, cutting only the largest. Some practice shallow planting; others plant more deeply and dig them with a machine. I have made some experiments during the past season to ascertain, if possible, what is the best kind of seed to use. The ground used for this purpose was a clay loam, and was an inverted green-sward, ploughed about seven inches deep. The potatoes were planted in hills, the rows being 3 feet by 2 feet 9 inches apart, making 5,280 hills to an acre. The number of hills planted of each kind was seventy, and the result figured out as if by the acre. The seed was carefully weighed, both at the time of planting and at the time of digging, and was estimated at the rate of sixty pounds to the bushel. The rows were marked with a horse-marker and the seed covered about two inches deep. The variety experimented with was the Garnet Chili, a variety largely cultivated in Central New York for local marketing. They were planted June 1, and harvested October 21.

Number.		Seed used per acre.	Large potatoes per acre.	Small potatoes per acre.	Total products per acre.
		Bush. of 60 *lbs.*	*Bush. of* 60 *lbs.*	*Bush. of* 60 *lbs.*	*Bush. of* 60 *lbs.*
1	One eye to a piece, and one piece in a hill	3½	102½	5½	108
2	One eye to a piece, and two pieces in a hill	9 1-6	175½	16	191½
3	Two eyes to a piece, and one piece in a hill	8 4-5	160½	14⅘	175⅖
4	Two eyes to a piece, and two pieces in a hill	13½	173	21⅝	194⅝
5	Three eyes to a piece, and one piece in a hill	10⅜	175½	21¾	197¾
6	Three eyes to a piece, and two pieces in a hill	18¾	164¾	41¼	205¼
7	Four eyes to a piece, and one piece in a hill	12⅝	156½	22½	179
8	Four eyes to a piece, and two pieces in a hill	27½	146½	47	193½
9	One large potato in a hill	44½	168	62	230
10	One large potato divided, in a hill	22	163	28½	191½
11	One small potato in a hill	10½	138	23	161
12	One small potato divided, in a hill	6½	125	18	143
13	Two small potatoes in a hill	21⅜	132½	46½	179½
14	One medium potato in a hill	26½	159	36½	195½
15	One medium potato divided, in a hill	16½	154⅜	26⅜	181¼
16	Seed end of the potato in a hill	12	158	24¼	182¼
17	Potato, with seed end cut off, in a hill	29	156⅜	38	194⅜
18	Two medium potatoes cut in two, four pieces in a hill	30¾	191	38	229
19	One medium potato quartered, four pieces in a hill	27½	168	62	230
20	One large potato in a hill, with eyes dug out	35	114	14⅓	128⅓
	Field-crop	.....	156½	28	184
	Field-crop, Peach-blows	.....	194	21¼	215¼

Some very interesting and curious facts are observable from a perusal of the foregoing table. The strongest seeding, in almost every case, furnishes the most flattering results. The largest yield were those of Nos. 9 and 19. 230 bushels to an acre, and a difference of about 17 bushels in amount of seed used, while the proportion of small potatoes was unusually large. The best proportion of large potatoes was in Nos. 2, 4, and 5, and largest amount in No. 18. Two eyes to a piece and two pieces in a hill, and three eyes to a piece, are better than two single eyes; while three eyes to a piece and two pieces in a hill give 11 bushels less of large ones than a single piece of the same number of eyes, and nearly double the number of small ones, as will be seen by referring to Nos. 5 and 6.

I find this minute in my memorandum at the time of planting, referring to Nos. 5 and 6: "The labor of cutting with three eyes to a piece is increased, and most of the seed ends thrown out." Also of Nos. 7 and 8: "Seed ends left in and generally divided, and sometimes more than four eyes to a piece and less care in cutting." No. 20, one large potato, eyes dug out. Of the seventy hills planted ten did not grow, and three of these were dug up and destroyed by fowls. I am satisfied that the proportion of those which did not germinate would have been less had the planting been earlier. Everything which resembled an eye was carefully dug out, and the potatoes were all carefully examined by other parties previous to planting. What does it prove? It proves the wonderful vitality of the potato, and that the cutting and planting may be done with a machine without fearing any material risk or damage from missed hills.

From the result of these experiments my previous opinions are confirmed, and I would say use good seed and avoid the danger of a depreciating quality by feeding the small ones to your stock. I usually plant a good medium sized potato, and, if large, cut it once in two lengthwise. The "field crop" noticed was grown alongside the above, and was, I think, less than my general crop.

These potatoes were grown in the town of Paris, Oneida County, New York, in an elevated locality, 1,500 feet above the level of the sea.

VINEYARD LANDS.—Our regular correspondent in Amador County writes as follows:

This county is situated on the western slope of the Sierras, extending from the summit to the foot-hills, with a breadth from north to south of thirty miles, and an altitude of 75 to 10,000 feet above tide-water. Beds of lava, indurated volcanic ash, breccia, and bowlders, remains of the volcanic epoch, are found all the way from the summit to some miles out on the plains, forming prominent landmarks all over the county. Every stream and gulch contains more or less of the broken-down matter of these beds, and without an analysis of the soil it is safe to conclude that it all contains a considerable quantity of volcanic *débris*. The slopes around these volcanic deposits have proved to be the paradise of the grape, where all kinds, whether from the borders of the Mediterranean or the Northern Rhine, flourish better than in their native homes.

The vines are usually planted 8 feet apart each way, the ground being previously plowed as deeply as convenient, say 8 to 12 inches. Rooted vines are preferred, as coming sooner into bearing and requiring less care than cuttings. They are trained to a height of 12 to 24 inches and staked up, for convenience in cultivating only, for the vines will bear equally as well, and, in the opinion of many, better, if laid flat on the ground, as there is no rain or dew to cause mildew or rot after the setting of the grape. The pruning may be done from November to March, in clear, sunny weather, as pruning in damp weather, however early in the winter, will cause the vine to bleed severely whenever the sap starts. They are trimmed to a close head, not more than three buds being left on a spur, and these all to be cut away the following year if buds nearer can be found. If the vines can be irrigated once or twice in June and July, they make a larger growth and come into bearing sooner. After the vine is pruned it is treated much like corn in the Western States, plowed with a bull-tongue shovel-plow, or anything that will loosen the ground to the depth of 3 or 4 inches, and all the suckers removed. After the trains cease they require no more attention except thinning out of the fruit, which is but little if the vines were properly pruned. A few bunches will be found the second year, and the fourth year a good crop will be obtained—two and a half to five tons to the acre. One man with a horse and plow will tend twenty acres, including pruning, suckering, cultivating, and gathering.

Gathering commences in October, and may be continued until December or even later, as the only loss is from birds and wild animals. It will be seen that but little work is required during the months of July and September, the hottest months of the year.

If the vines can be irrigated the yield may double the above estimate. The grapes will be improved for table use, being larger and of a milder flavor, but are not so valuable for wine, owing to the excess of watery matter. The writer of this article has more than once picked small patches of grapes yielding at the rate of sixteen tons to the acre.

It is quite possible to make a large vineyard yield that occasionally, though such overbearing injures the vines very much. Only moderate crops can be relied on every year.

The liabilities to failure if the site is well selected and the land well tended do not amount to 1 per cent.

Vineyards on low, moist lands are liable to mildew and late and early frosts. An elevation of 10 or 20 feet above the zones of cold air in the valleys insures against all loss by frost or mildew. In consequence of the want of transportation, grapes were worth in 1872 but $15 per ton, and demand limited at that.

Fully one-half the land of this county, below the altitude of 3,000 feet, is adapted to the cultivation of the grape in patches of five to forty acres, without further expense than clearing off the brush and fencing. Much of this land is now subject to pre-emption and homestead.

A railroad from tide-water is projected, and will probably be built in a short time, which will reach the center of this vine-land. No part of the United States holds out greater inducements for men of small capital who wish to engage in the cultivation of the grape.

STOCK ITEMS.—The following items are from our April correspondence:

Cambria County, Pa.—Many individuals are procuring Alderney cows for their own private use. The cost is from $150 to $250 each, the price being regulated by age and purity of blood. They are regarded as being profitable even at the high price they cost. The Cambria Iron Company of this place own many farms which they have bought for the minerals, iron ore, and stone coal, and being desirous of giving an impulse to the agricultural interests of the county, are devoting both skill and means to that purpose. They have procured a competent superintendent, and have purchased the best of utensils and machinery for cultivating the different farms, and have commenced the establishment of distinct herds of thoroughbred cattle. They have placed Alderneys on one farm, Devons, Short-Horns, and Herefords, each, on others. As these herds are of recent establishment, we cannot give full information with regard to their comparative profits, though the Herefords have proven to be profitable, there being a very great demand for the calves at prices averaging $50 at from four to six months old.

Hot Spring County, Ark.—The Chinese or Poland hog seems to have been the most profitable stock imported here. A gentleman in my neighborhood bought one pair, which cost him $28 for the pair. He has sold pigs from them for $20 apiece. The pair has netted him $410 in eighteen months. The total amount of cost and feed in that time was $65, making a clear profit of $345.

Tuolumne County, Cal.—Some attention is paid to crossing the common goat with the Angora. The grades are not sufficiently high for shearing, but there is great improvement in the fattening qualities and in the flavor of the meat. The skins of three-quarter and seven-eighth grades make beautiful robes; livery-stable keepers are anxious to get them, and prefer them to any other robes, being handsomer and more durable.

REMEDY FOR LEECHES IN THE LIVER OF SHEEP.—Our correspondent in Clackamas County, Oregon, having read the description of the symptoms of leeches in the liver of sheep, as given by our correspondent in Lane County, and published on page 521 of the monthly reports for 1872, states that, fifteen to eighteen years ago, a disease prevailed among sheep in Clackamas County, of which the symptoms were in all respects the same, and it was ascertained that they originated in the same cause. The local name by which the disease was then known was "swelled jaw." Hundreds upon hundreds of sheep died of it. After many ineffectual experiments for remedies had been tried, a farmer dissected one of the many sheep which had died out of his flock and found its liver filled with leeches. Among other applications to the living leeches, he tried saleratus, and found that it killed them immediately. He then mixed saleratus with the salt given to the diseased sheep. They soon began to recover. In a short time all were well. The news of the discovered remedy spread. Others tried it with equal success. Within a few months there were no sheep in the region affected with the disease, and since that time our correspondent has never heard of another case in the county.

CROP PROSPECTS IN CALIFORNIA.—The following facts and prognosti-

cations are gathered from a communication of a correspondent in Sonoma County. Rains sufficient to fit the ground for plowing and putting in grain fell early in November. The weather was delightful till past the middle of December, but about the time of the winter solstice abundant rains fell, amounting for the season to 9.55 inches. Through January the weather was clear and warm, and the farmers improved it to the utmost. The breadth of grain sown in the State is probably larger than ever before. That sown early, and all that sown by harvesting of last year, called "volunteer crops," looks very fine, standing from three to eight inches high and covering the ground well. The early rains reached all the valleys in the State, and the recent rains have been equally extensive, and have fallen to an average depth of two and a half inches. The maturing of the great body of crops seems to be already insured, even though there should be no further rains. Grass is well up, pastures are fine, and cattle and sheep are doing well. The prospect now is that the agricultural products of California for the coming season will be larger than ever before; the wheat-crop alone promises to reach 30,000,000 bushels. The lowest temperature during the winter was 23½° above zero. Flowers and semi-tropical plants are in blossom, and all things conspire to make the season seem like one long and delightful spring.

HILL-WHEAT.—Messrs. Murray, Davis & Co., publishers of the Cincinnati *Price Current*, have furnished this Department with a sample of wheat known as the "hill-wheat," in the Cincinnati market. It is grown principally in Kentucky, Tennessee, and Southern Illinois. Its name is supposed to have originated from the fact that it is mostly the product of the hilly districts of those States. It corresponds to the amber wheat of more northern latitudes, and ranks between the Mediterranean or red wheat, and the choice white wheat. In the Saint Louis market it is quoted as No. 1 wheat.

NEED OF MORAL EDUCATION IN ARKANSAS.—On page 513 of the monthly reports for 1872 there is a brief article in which are given the results of the different courses of agriculture pursued since the war by two planters of equivalent fortunes, residing in the same locality in Louisiana. The one had pursued the ante-war method, and adhered to the culture of cotton alone, the other had recognized the new conditions consequent upon the war, and adopted the method of diversified agriculture. It is represented that the results are altogether in favor of the latter. Our correspondent in Arkansas County, Arkansas, calls attention to this representation, and wishes to give as the result of his own experience "the other side." He says:

> When the war closed I also tried the diversified plan. I had eight acres in apples, pears, and plums; twelve acres in peaches; a fair lot of improved hogs, and a nice lot of sheep. My apples are all stolen, so that I never have any to put up for winter. My hogs have long since been stolen. I have cut down my peach-orchard. If I plant a garden and have a nice lot of vegetables, they are all stolen. If I put up a nice crib of corn, the lock is forced and my corn is stolen. So I have come down to cotton and just enough corn to make my crop. Money can be made by that system if one only attends to his business and doesn't spend too much. Still, I will admit that the diversified system is much better, and there is more money and more happiness in it; but there are some things people cannot do.

The concluding statement, so far as it applies to the case in hand, seems to need qualifying thus: there are some things people cannot do until they have first done some other things. The difficulty which our correspondent found so trying that he was discouraged by it is one which exists in every section—North, East, and West, as well as South—

where the mental and moral education of any considerable portion of the population is long neglected, and one which does not exist to such an extent as to be a serious hinderance to diversified agriculture and the plenty and happiness it brings in any section where free schools and churches, within the reach of all, have been in operation long enough to produce their legitimate effects.

AGRICULTURAL REPORTS OF ODESSA.—During 1872 the agricultural reports of Odessa, Russia, embraced 3,838,000 tschetwerts* of wheat; 363,600 of rye; 57,800 of maize; 315,250 of barley; 46,000 of oats; 13,050 of peas; 151,800 of linseed; 115,500 of rape and other seeds; 130,500 pouds of flour; 331,100 of wool; 40,600 of tallow. Compared with 1871, the wheat exports show an increase of 40,000 tschetwerts; peas, linseed, and other seeds also increase their aggregates. Rye, maize, barley, and oats, however, fell off heavily, especially maize, which indicates a loss of 358,200 tschetwerts. Flour exports more than doubled, while wool and tallow show very large increments. During the year 541 sail-vessels and 504 steamers cleared from the port with freight. The sail-vessels have declined in number from 996 in 1870 and 797 in 1871. The steamers, on the contrary, enlarged from 300 in 1870, and 425 in 1871. Of the sail-vessels, the larger number—191—were Italian; of the steamers, the greater number—270—were English. Only 41 sail-vessels and 120 steamers were Russian.

FARM STOCK AND PRODUCTS IN NEW MEXICO.—An occasional correspondent, writing from Colfax County, New Mexico, January 25, 1873, gives some agricultural information gained through his own observation and experience during a year's residence. The winter of 1871-'72 was considered a very severe one. All kinds of stock, except those housed and fed, which were few and far between, suffered greatly. In April it seemed as though all would die, but, though cold and hunger had consumed everything except "skin and bones," the most of them survived. The hard winter was followed by a drought which continued till late in the summer; but then, in consequence of frequent and abundant rains, grass became plentiful and luxuriant, and in the fall cattle had become so fat that it would do one good to look at them. This winter, thus far, there has been little wind, no snow, and generally mild and pleasant weather, very different from the severely cold weather which has prevailed in the States and in the Territories north. Our correspondent resides on high land near the Montezuma and Aztec mines, and in that neighborhood cattle are wintering well, steers and barren cows being still fat enough for good beef. Cattle and sheep in the lower valleys are also now in fine condition. But, as few stock-raisers make any provision for sheltering or feeding their flocks and herds, should the latter part of the winter bring snow-storms and cold, high winds, if they do not perish, they will again come out in the spring reduced to "skin and bones."

The writer houses his milch-cows and feeds them on Hungarian hay at night, letting them run out in the day-time. For his other stock he has built stables and sheds as shelters in time of storms and cold winds, and in spells of severe cold he feeds them on oat-straw. Thus protected from suffering, he is confident they will come out in spring almost as fat and sleek as they were in the autumn.

As to the state and style of agricultural industry, he represents that you have but to think of its condition in Mexico one or two hundred years ago, and you get a pretty correct idea of what it is now in New Mexico. Nevertheless, as one bushel of grain will go about as far there in feeding stock as three will in the States, and as corn and oats are

* A tschetwert is 5.95205 bushels.

worth in money about three times as much as in the States, it is thought that, in view of the limited amount of means, intelligence, and industry invested, the husbandman is there abundantly rewarded. Besides cereals, beans, pease, most varieties of cabbage and root-crops, and other garden-vegetables thrive and grow to great perfection.

It is alleged by our correspondent that Colfax County is cursed with a "land-grant," made to Beauvian and Maranda, and subsequently sold by L. B. Maxwell to an English company, who claim under it almost the whole county. Until recently settlers have respected their claim, but now, under the current belief that it is extended far beyond the original grant, they are "settling all over the county."

FARMERS IN COUNCIL.—The farmers of Montgomery County, Maryland, recently held a convention at Sandy Spring, at which some agricultural topics of practical importance were discussed and acted on. One was whether any means could be devised by which the several farmer's clubs in the county can carry on, in concert, a series of agricultural experiments so as to secure a comparison of definite results. The discussion led to the raising of a committee charged with the duty of making further investigation of the subject. A comparison of views on the question whether the epizooty has left horses enfeebled, resulted in a general conclusion that horses which were overworked or unduly exposed while the disease was upon them, if not permanently injured, were at least left in a delicate condition, and that hence all should treat them with due care and avoid overtaxing them. Mr. William J. Scofield presented a written statement of his dairy operations for the past year. He reported a herd of nine cows, and, reckoning from January 1, 1872, to January 1, 1873, an average of 200 pounds of butter per cow. This was sold at 43 cents per pound, amounting to $774, of which he reckoned $650 as profit. Attention being called to the fact that in Maryland the legal weight for a bushel of oats is 26 pounds, while in the District of Columbia it is 32 pounds, a committee was appointed to bring the matter before the District legislature and endeavor to effect a change. It would seem that the application is to be made to the wrong legislature, since 32 pounds is the prevailing weight in the United States; out of thirty States in which the weight per bushel of oats is fixed by law, it is 32 pounds in eighteen, 30 in five, 33 in two, and 26, 28, 33½, 34, 35, and 36 in many single States.

A RECORD OF COST AND PROFIT ON FARM PRODUCTS.—Mr. Fargo, secretary of the Batavia Farmers' Club, Genesee County, New York, kept, in 1872, a careful account of each item of expense in raising his farm-crops. The record, with the results, is here given:

	Expense per acre.					Proceeds per acre.			
	Manure.	Labor.	Seed.	Interest and taxes.	Total.	Straw and fodder.	Grain and vegetables.	Total.	Net.
Oats	$3 12	$10 28	$1 25	$7 47	$22 12	$6 25	$19 00	$25 25	$3 13
Corn	6.25	13 59	25	7 47	27 56	10 60	22 78	32 78	5 22
Potatoes	.....	16 70	4 62	7 47	28 79	.....	58 66	58 66	29 87
Roots	.....	110 00	5 00	14 94	129 94	.....	250 00	250 00	120 06
Clover	.....	5 00	.....	7 47	12 47	30 00	.....	30 00	17 53

The expense per bushel was, oats, 40 cents; corn, 44; potatoes, 20; roots, 13; the profit per bushel, oats, 6 cents; corn, 16; potatoes, 20; roots, 12; the average profit per acre, about $11.11; total profit, $546.49; the total of acres cultivated, 49½.

PROFIT IN FEEDING SHEEP.—At a recent meeting of the Farmers' Club in Batavia, Genesee County, New York, Mr. George Burt presented the following definite statistics relative to the cost and profit of feeding sheep for market: He paid for 200 sheep for fattening, $915; for keep, two months, $64; 8 tons of hay, at $16 per ton, $120; 4 loads of corn-stalks, $16; 148 bushels of corn, 60 cents per bushel, $88.80; one barrel of salt, $3; interest on money invested, $20.75; total $1,227.55. January 4, he sold 171 sheep, at 8 cents per pound, $1,522.40; 28, at 6½ cents per pound, $181.79; one pelt, $1.50; total, $1,705.69; profit on the 200 sheep, $478.14.

Mr. Burt holds that sheep, in winter, should be kept in small flocks, less, rather than more, than 65 in a flock, in yards where they can have free access, at all times, to water; that they should be kept free from all disturbing or exciting causes; that open sheds are better for them than a close barn; and that it is best to feed grain to them whole.

YIELD IN PENNSYLVANIA.—The reports of the several members of the Brady Agricultural Society, Mifflin County, Pennsylvania, make the average yield of the section represented by them to be as follows: wheat, per acre, 13½ bushels; corn in the ear, 87⅛; oats, 36⅔; potatoes, 61¼; clover-seed, 1; hay, 1½ tons. The highest yields per acre reported were, wheat, 24 bushels; corn in the ear, 133; oats, 46.

MAD DOGS IN TENNESSEE.—A recent report from our correspondent in Sevier County, Tennessee, represents that the object of greatest dread in that county was mad dogs, of which more than twenty had been killed within the previous two weeks. There had, as yet, been no human victim, but many hogs and some oxen and cows had been bitten and gone mad.

AGRICULTURAL FEATURES IN KANSAS.—Our correspondent in Chase County, Kansas, sends us a description of the geographical features, soil, climate, and productions of that county, of which the following is a condensation: In the valleys, which abound, the soil is a black loam from 3 to 30 feet deep. The upland is all covered with limestone soil from 1 to 3 feet deep. Along the streams there is timber varying from a mere border to belts half a mile in width. The varieties include burr-oak, walnut, hickory, white and red elm, cottonwood, mulberry, honey-locust, sycamore, box-elder, willow, &c. On the upland there is no timber; except in the bottoms, limestone extends all over the country. As the land rises from the valleys it crops out at different levels in three ranges of ledges. Above a certain height stones disappear, but there is scarcely a location where the finest stone for building cannot be found within the distance of a mile. In the western part of the county gypsum is found.

According to statistics, less rain falls here than farther east, but the most of that which does fall comes during the growing season, June being the rainy and August the dry month. There is scarcely any rain, and but little snow, in winter. The water from wells, which average about 30 feet in depth, is excellent. This is probably the best-watered county in the State. The Cottonwood River, running very nearly through the center of the county, averages 100 feet in width, (banks about 30 feet high,) and this main artery is fed by almost innumerable smaller streams on either side.

Following a wet season there is some fever and ague; but, as wells are dug (affording pure water) and better houses are built, it decreases.

Improved land sells at $16 to $25 per acre; unimproved at $4 to $10; choice lots as high as $15. Probably not more than one-twentieth is improved; the remainder is nearly all owned by railroads and non-residents. The number of inhabitants is about 3,000, and the Gulf States are the only ones not represented by the settlers.

The soil and climate are adapted to all productions cultivated in the same latitude at the East, but especially to wheat. With fair cultivation, in a good season, it is no uncommon thing for fall-wheat to yield 40 bushels per acre; as many as 50 per acre have been raised here; but the average would probably fall to 25, or, it may be, 20. The best grass is called blue-stem; a blue-joint grows in the bottoms tall enough to hit in the face one who is riding through it on horseback. In good seasons it will cut three tons to the acre; average, two tons. The leading productions are cattle, horses, and wheat, cattle predominating. The principal varieties of fruit raised are apples, peaches, grapes, and the various small fruits.

PROGRESS IN TEXAS.—A casual correspondent in Washington County, Texas, writing January 16, reports that in that section there has been an unusual amount of moderately cold weather, but no snow or sleet; that winter rains have been abundant, but not excessive; that stock is coming through the winter in fine condition for spring work, and that the ground is in fine condition for plowing. He states that in each of the years 1871 and 1872 it is estimated that Washington County produced, in addition to an abundant supply of corn, 30,000 bales of cotton. He adds: "There has been a heavy immigration to our county, and farmers have obtained labor more readily this year than any other since emancipation. Land is advancing in price, and there will be an increase of 10 per cent. in the quantity in cultivation in 1873 over that in 1872. The bulk of this will be planted in our great staples, corn and cotton."

NEED OF A NEW SYSTEM OF STOCK-RAISING IN TEXAS.—The following statements are condensed from a report of our correspondent in Nueces County: The severe drought last summer left the older stock mere walking shadows, and the younger not much better. The cold weather began early in November and continued through December, except that for about fifteen days either heavy or drizzling rains fell. This long spell of severe weather occasioned the death of thousands of cattle, and should there be another cold spell the mortality must be still greater. An extensive cattle-raiser states that there are now on the range thousands of cattle which have not strength enough left to travel five miles. If the prevailing system in this county of raising cattle is not changed they will all die out within a few years. The county is now increasing in population; settlements are springing up all over it, and the farmers are endeavoring to protect themselves against the encroachments of cattle-raisers. Many of the latter own but few acres of land, and yet keep from ten to twenty thousand head of cattle, which they permit to roam at will. This, of course, occasions great dissatisfaction, and results in great evil. It is hoped that the State legislature will soon provide an effectual remedy.

HOW TO SUCCEED IN RAISING MELONS AND CUCUMBERS.—A correspondent in Oswego County, New York, describes a process by which, even in that climate, he has "splendid success in raising melons." The description is somewhat lengthy; but as its length results from its

exactness, we will let him convey to the reader all the particulars, without condensation. He says:

Soon as the ground becomes a little warm I plow, and then, selecting a place where the ground is sandy, I dig holes about 20 inches in diameter and 14 to 16 inches deep. Have the holes about 6 feet apart each way. Leave them open a day or two to allow the ground to warm at the bottom; then put into each hole nearly a half-bushel of manure—fresh horse-manure preferred. Stamp down the manure, cover it with the dirt dug out, about 2½ inches deep, and pat down with the hoe. The hill will now be quite *dishing*, say 4 inches or more. Now I place near my melon-patch a cask, into which I put a small wheelbarrow load of fresh cow-dropping and a couple of shovelfuls of night-soil. Into this cask I put the soap-suds and keep it full. If the weather is dry I occasionally moisten the hills from the cask; evening is the best time. About the 20th of May I cut up a thin, tough sod and place it, grass side down, in an old tin-pan, and sprinkle about half an inch in depth of fine sandy loam upon it. On this I put my seeds, *very thick;* then put upon these another sod, as large as the pan, grass side up. Upon this I pour a teakettle-full of boiling-hot water and set the pan near a stove, where it will keep warm. Each morning I pour on a little more hot water. In about three days the seeds will have sprouts about half an inch long. Now remove the upper sod, shake the pan a little, and the seeds will rise from the fine dirt put upon the lower sod. Put twelve or fifteen seeds in each hill after slightly scratching the dirt. *Handle the seeds carefully, so as not to break the sprouts.* Cover about three-quarters of an inch with dirt. By taking this course your vines will in two weeks be as far advanced as they would be in four or five planted in the usual way. Let the weeds grow in and about the hill as a protection from bugs and worms. The vines will grow rapidly, and of course somewhat tall and spindling. If the weather is dry, moisten from the cask two or three times a week, *always at evening.* This will keep the manure moist and in a state of fermentation, causing considerable heat. When the vines have grown about four inches high remove the longest weeds and perhaps some of the vines, and fill in with dirt nearly up to the leaves. By and by, in a moist day, remove the weeds from the hill, leaving them growing around the borders. Thin out the vines to five or six, leaving some for the worms. Keep the dirt well up to the leaves. Your hill will now be nearly level. Finally, thin out to three or four of the most thrifty vines. *Remember the cask.* Take away the old dirt with your fingers and add fresh dirt two or three times a week. The hill will soon become crowning. Make a small ditch around the hills, say two inches deep, and fill this occasionally with suds from the cask. After the vines nearly cover the ground, and the melons are well set and of pretty good size, cut off the ends of the vines. In this way the melons will grow much larger. I raise as large and fine melons here in Amboy, Oswego County, (on the eastern border of Lake Ontario,) as I ever saw on Long Island or anywhere else. It of course demands labor and care; but let any one try this plan and he will find his efforts amply rewarded. I follow the same rule with cucumbers as with melons.

WHEAT AND CORN PRODUCTS OF CASS COUNTY, IOWA.—The secretary of the Cass County Agricultural Society reports:

The Arnautka wheat is a hard, flinty variety. It has been raised in this county two years; is a *prolific yielder*, but of inferior quality, being so hard that it is impossible to make choice flour out of it. It is only worth 75 cents per bushel in this market, where wheat like the Oran from $1 to $1.10 per bushel. Our best wheat is Australian and *soft* Siberian. The Australian is a soft, choice wheat, and yielded as high as 40 bushels per acre last season. This is a good wheat county. Of the crop of 1872, up to present date, there have been shipped from this point, Atlantic, over 200,000 bushels, at an average price of $1 per bushel. Of corn there are cribbed in this place 100,000 bushels; 50,000 bushels have been shipped, and only a small part is in as yet. All has been bought at 15 cents per bushel. It is now worth 17 cents.

EXHAUSTED SOILS RENOVATED WITH COTTON-STALKS.—Our correspondent in Murray County, Georgia, writes:

The raising of corn, wheat, and stock for the use of the farm, and, beyond that, cotton, is certainly the true policy for the farmers of this county. Cotton pays better than any other crop, but not well enough to justify one in raising it altogether and buying his own provisions. An experiment came under my observation which proves that cotton, so far from exhausting the soil, is a great renovator when properly managed. My son-in-law took two acres of old, worn-out, completely exhausted land, four years ago, and planted it in cotton. Each winter, after the stalks had become tender, he took a stick and beat them in pieces; then run a long bull-tongue plow, as deep as

a strong mule could pull it, under the roots of the old stalks, and with a one-horse turning-plow threw all the old bolls and stalks on the ridge. This he did each year, and did not suffer any stock whatever to go on the lot. The crop nearly doubled itself each year: the first year it made 350 pounds of seed-cotton, the last 2,200 pounds. No manure whatever was used.

GRAPE-CULTURE IN OREGON.—A correspondent in Jackson County, which borders on California, reports that in that section experiments in grape-culture have proved entirely successful. That county already manufactures most of its wine for home-consumption, and those regarded as good judges of wine pronounce the quality excellent. As a result of this successful trial, several vineyards have been greatly enlarged this season.

AVERAGE YIELDS IN ILLINOIS.—The secretary of the Butler Agricultural Club in Montgomery County, Illinois, reports that the members raised, in 1872, products as follows: Total acres of wheat, 465; product, 6,304 bushels; average yield, 13½ bushels per acre. Acres of corn, 708; product, 30,745 bushels; average per acre, 43½ bushels. Acres of oats, 326; product, 16,400 bushels; average per acre, $50\frac{4}{13}$ bushels. Acres of meadow, 342; product, 548½ tons; average per acre, $1\frac{3}{5}$ tons. Acres of Hungarian grass, 15; product, 25 tons; average per acre, $1\frac{2}{3}$ tons.

AGRICULTURAL PRODUCTS OF SANTA CRUZ.—The island of Santa Cruz (under the jurisdiction of Denmark) has an area of about sixty square miles, and, according to a census taken in 1870, a population of 23,194, in which there were 1,022 more females than males. The surface of the island, which has scarcely a running stream, is generally elevated and rolling, in some parts mountainous. Its scenery is represented to be charmingly picturesque and fascinating, and its highways, kept in perfect order, to be almost equal in attractions to the drives in the Central Park of New York. Its agricultural industry is almost wholly limited to the production of sugar, molasses, and rum from cane. It is estimated that at least four-fifths of the provisions, lumber, and implements of culture and manufacture for the supply of the plantations are imported from the United States, while by far the largest portions of the molasses and rum produced are exported to the United States. The sugar is chiefly exported to Denmark. The crop of sugar in 1871, amounting to 16,000 hogsheads, was much larger than had been produced for many years previous. The exports of the island, for the year ending September 30, 1871, were 23,618,873 pounds of sugar, of which the value was $1,136,564.79; 1,054,568 gallons of molasses, value, $243,394.83; and 358,894 gallons of rum, value, $78,602.95. The total value of its exports to the United States for the same year was $834,336.42, which was $433,389.99 in excess of the value of its exports to this country the preceding year.

MARKET PRICES OF FARM-PRODUCTS.

APRIL, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month.

Articles.	Price.		
NEW YORK.			
Flour, superfine State...per bbl.	$6 15	to	$6 75
extra State.....do...	7 00	to	8 35
superfine western...do...	5 90	to	6 65
extra to choice western, per barrel.....	6 90	to	12 75
southern shipping, common to choice..per bbl.	6 10	to	8 25
southern family, ordinary to choice.....per bbl.	8 40	to	12 75
Wheat, No. 1 spring...per bush.	1 75	to	1 80
No. 2 spring.....do...	1 59	to	1 69
winter, red, west'n..do...	1 70	to	1 87½
winter, amber, western, per bushel.....	1 80	to	1 97½
winter, white, western, per bushel.....	1 85	to	2 25
Rye.....per bush.	88	to	— —
Barley.....do...	1 15	to	1 19
Corn.....do...	64	to	79
Oats.....do...	45½	to	55
Hay, timothy, fair to choice, per ton.....	24 00	to	30 00
shipping grades....per ton.	20 00	to	— —
Pork, mess.....per bbl.	16 50	to	16 75
extra prime.....do...	— —	to	13 50
prime mess.....do...	15 75	to	16 75
Lard.....per lb.	8½	to	9 1/16
Beef, plain mess....per barrel.	9 00	to	11 75
extra.....do...	12 00	to	13 50
Butter, western.....per lb.	18	to	31
State dairy.....do...	32	to	48
Cheese, western, factory....do...	12	to	15
State factory.....do...	13½	to	17
Cotton, ordinary to good ordinary.....per lb.	15⅝	to	17½
low middling to good middling.....per lb.	19	to	22¾
Tobacco, lugs, all grades...do...	7½	to	8½
common to medium leaf.....per lb.	8½	to	10½
Wool, American Saxony, fleece, per pound.....	63	to	73
American merino, full blood.....per lb...	63	to	73
American, combing...do...	63	to	73
pulled.....do...	42	to	55
California spring clip, unwashed.....per lb.	32	to	39
California fall clip, unwashed.....per lb.	22	to	27
Texas.....do...	20	to	38
BOSTON.			
Flour, western, superfine..per bbl.	5 50	to	6 00
western extras.....do...	6 75	to	9 00
western choice.....do...	9 50	to	12 00
southern extras.....do...	6 75	to	7 25
choice Baltimore....do...	10 00	to	12 00
Wheat.....per bush.	1 60	to	2 00
Rye.....do...	95	to	1 00
Barley.....do...	90	to	1 20
Oats.....do...	48	to	57
Corn, southern yellow.....do...	72	to	— —
western yellow.....do...	72	to	73
Hay, eastern and northern, per ton.....	18 00	to	28 00
Beef, western mess.....per bbl.	12 00	to	12 50
western extra.....do...	13 00	to	14 00
Pork, prime.....do...	12 75	to	13 50
mess.....do...	16 25	to	16 50
Lard.....per lb.	8¾	to	9½
Butter, N. Y. and Vt.....do...	20	to	40
western.....do...	18	to	32

Articles.	Price.		
BOSTON—Continued.			
Cheese, N. Y. and Vt. factory, per pound.....	$0 12	to	$0 17
N. Y. and Vt. dairy, per pound.....	11	to	16
Ohio factory, good to choice.....per lb.	13	to	16
Cotton, ordinary to good ordinary.....per lb.	14	to	17⅞
low middling to good middling.....per lb.	19	to	22½
Tobacco, lugs.....do...	8½	to	10
common to medium leaf.....per lb.	9½	to	10½
Wool, Ohio and Pa.....do...	50	to	62
Michigan.....do...	50	to	55
other western.....do...	48	to	55
pulled.....do...	20	to	55
combing fleece.....do...	60	to	65
California.....do...	18	to	35
Texas.....do...	18	to	30
PHILADELPHIA.			
Flour, superfine.....per bbl.	5 00	to	5 50
Pa. extra.....do...	7 25	to	— —
Pa. family.....do...	8 00	to	9 00
western family.....do...	7 50	to	8 25
western, fancy.....do...	8 37½	to	12 00
Wheat, winter red, western, per bushel.....	1 85	to	1 95
winter, amber, western, per bushel.....	1 95	to	— —
winter, white, western, per bushel.....	1 90	to	2 12
spring.....per bush.	1 68	to	1 95
Rye.....do...	82	to	83
Barley.....do...	90	to	1 22
Oats, western, mixed.....do...	46	to	48
western, white.....do...	48	to	50
Corn, yellow.....do...	59	to	61
white.....do...	60	to	65
Hay, fresh, baled.....per ton.	24 00	to	30 00
common to fair shipping, per ton.....	20 00	to	24 00
Beef, western mess.....per bbl.	8 00	to	10 00
extra mess.....do...	10 00	to	12 00
Warthman's, city, family...do...	16 00	to	— —
Pork, mess.....do...	17 00	to	17 25
prime, extra.....do...	14 00	to	— —
Lard.....per lb	8¾	to	11½
Butter, choice.....do...	35	to	45
good.....do...	28	to	35
Cheese, N. Y. factory.....do...	16	to	17
Ohio factory.....do...	15	to	16
Cotton, ordinary to good ordinary.....per lb.	15	to	19
lowmiddling to good middling.....per lb.	18¾	to	21
Wool, Ohio common to XX...do...	40	to	55
Colorado, washed...do...	24	to	27
combing and delaine..do...	60	to	76
pulled.....do...	25	to	46
unwashed.....do...	30	to	35
BALTIMORE.			
Flour, superfine.....per bbl.	5 00	to	8 50
extras.....do...	6 50	to	9 75
family and fancy....do...	8 25	to	12 00
Wheat, white, fair to choice, per bushel.....	1 85	to	2 10
amber, choice..per bush.	2 10	to	2 12
red, common to prime, per bushel.....	1 60	to	2 05

Market prices of farm-products—Continued.

Articles.	Price.		
BALTIMORE—Continued.			
Wheat, red, western ...per bush.	$1 65	to	$1 75
Rye, common to prime .....do...	80	to	90
Corn, white southern.....do...	63	to	65
yellow southern.....do...	60	to	— —
mixed western .....do...	60	to	— —
Oats, southern .....do...	46	to	49
western .....do...	45	to	49
Hay, western, good.....per ton.	25 00	to	30 00
Pork, mess .....per bbl.	16 50	to	16 75
Beef, Baltimore mess.....do...	15 00	to	20 00
extra .....do...	23 00	to	25 00
Lard .....per lb.	8½	to	9½
Butter, N. Y .....do...	33	to	42
choice western .....do...	36	to	40
good, to prime western, per pound	24	to	32
Cheese, eastern.....per lb.	17½	to	— —
western .....do...	16½	to	17
Cotton, ordinary to good ordinary .....per lb.	16	to	17½
low middling to good middling.....per lb.	18½	to	19½
Tobacco, lugs .....per cental.	7 50	to	8 50
common to medium leaf, per cental.....	8 50	to	11 00
Wool, fleece-washed, common to fine .....per lb.	— —	to	— —
tub-washed .....do...	55	to	60
unwashed .....do...	35	to	38
pulled.....do...	35	to	40
CINCINNATI.			
Flour, superfine .....per bbl.	5 25	to	5 75
extra .....do...	7 00	to	7 35
family and fancy ....do...	7 40	to	9 00
Wheat, red winter, No. 1, per bushel	1 68	to	1 70
red winter, No. 2, per bushel	1 60	to	1 65
white.....per bush.	— —	to	— —
Rye .....do...	79	to	80
Barley .....do...	50	to	90
Corn .....do...	38	to	40
Oats .....do...	31	to	38
Hay, baled, No. 1.....per ton.	19 00	to	21 00
lower grades .....do...	15 00	to	18 00
Beef, plate.....per bbl.	14 00	to	— —
Pork, mess .....do...	16 75	to	17 00
Lard .....per lb.	8⅜	to	8½
Butter, choice .....do	37	to	40
prime .....do	34	to	36
fair to good.....do	28	to	32
Cheese, factory, good to choice, per pound	15½	to	16½
pine-apple .....per lb.	22	to	23
Cotton, ordinary to good ordinary .....per lb.	12½	to	15⅝
low middling to good middling .....per lb.	17¾	to	20
Tobacco, lugs .....do...	— —	to	— —
common to medium leaf, per pound.....	— —	to	— —
Wool, fleece-washed, common to fine.....per lb.	45	to	48
tub-washed .....do...	48	to	50
unwashed, clothing .do...	30	to	32
unwashed, combing .do...	40	to	45
pulled.....do...	35	to	36
CHICAGO.			
Flour, white winter extras, fair to choice.....per bbl.	8 25	to	10 75
red winter extras ...do...	7 00	to	8 50
good to choice spring extras.....per bbl.	5 75	to	6 75
spring superfines ...do...	3 00	to	4 75
good to fancy Minnesota, per barrel.....	6 50	to	8 50

Articles.	Price.		
CHICAGO—Continued.			
Wheat, No. 1 spring ...per bush.	$1 26	to	$1 28
No. 2 spring.....do...	1 17	to	1 19¼
No. 3 spring.....do...	1 07	to	1 09¼
Rye, No. 2.....do...	64½	to	65½
Barley, No. 2 .....do...	75	to	78
Corn, No. 2 .....do...	30½	to	33
Oats, No 2 .....do...	24½	to	26
Hay, timothy .....do...	13 50	to	16 50
prairie .....do...	9 00	to	10 50
Pork, mess .....per bbl.	15 60	to	— —
Beef, mess .....do...	9 00	to	9 50
extra mess.....do...	10 00	to	10 50
Lard .....per cental.	8 00	to	8 15
Butter, strictly choice dairy..p. lb.	30	to	33
common to choice roll, per pound.....	20	to	27
Cheese, N. Y. factory.....per lb	17	to	18
Ohio factory .....do...	16	to	17
western factory....do...	15	to	17
Wool, tub-washed.....do...	51	to	61
fleece-washed.....do...	40	to	53
unwashed .....do...	28	to	33
pulled .....do...	42	to	46
NEW ORLEANS.			
Flour, superfine .....per bbl.	5 12½	to	5 90
extra.....do...	6 25	to	8 25
choice .....do...	8 50	to	10 50
Corn, white .....per bush.	58	to	60
yellow .....do...	58	to	59
Oats .....do...	44	to	45
Hay, prime.....per ton.	25 00	to	27 00
choice .....do...	27 00	to	27 50
Pork, mess .....per bbl.	17 25	to	17 50
extra prime.....do...	— —	to	— —
Beef, Texas .....do...	11 50	to	12 50
western and northern.do...	15 00	to	16 50
Fulton market, per half bbl.	12 25	to	— —
Lard .....per lb.	8¼	to	9¾
Butter, choice western .....do...	30	to	32
choice Goshen .....do...	44	to	45
prime Goshen .....do...	40	to	42
Cheese, choice western factory, per pound	17	to	17½
New York cream.per lb.	19	to	20
Cotton, ordinary to good ordinary .....per lb..	13½	to	17¾
low middling to good middling.....per lb.	18½	to	20¾
Tobacco, lugs.....do...	8	to	9
low leaf .....do...	9	to	10
medium leaf.....do...	10	to	11
Wool, lake .....do...	30	to	35
Louisiana, clear.....do...	25	to	30
SAN FRANCISCO.			
Flour, superfine .....per bbl.	4 50	to	4 80
extra.....do...	5 00	to	5 25
higher grades .....do...	5 50	to	5 75
Wheat, State .....per cental.	1 50	to	1 87½
Oregon .....do...	1 75	to	1 85
Barley .....do...	1 15	to	1 40
Oats .....do...	2 25	to	2 40
Corn, white .....do...	1 25	to	1 30
yellow .....do...	1 20	to	1 25
Hay, State .....per ton.	22 50	to	— —
Pork, mess.....per bbl.	18 00	to	19 00
prime .....do...	17 50	to	18 00
Beef, mess.....do...	10 00	to	12 00
family mess ...per half bbl.	9 00	to	10 00
Lard .....per lb.	9¾	to	11
Butter, overland .....do...	15	to	20
California.....do...	22½	to	27½
Oregon .....do...	15	to	18
Cheese .....do...	12	to	16
Wool, native .....do...	10	to	12
Californian .....do...	20	to	25
Oregon .....do...	20	to	25

LIVE-STOCK MARKETS.

NEW YORK.

CATTLE.—Thin native steers, dressing 56 pounds per cwt., $10.50 per cental; fancy or premium bullocks, dressing 60 pounds per cwt., $14,50 per cental; actual range of native cattle, $11 to $14 per cental; Texans, dressing 55 to 57 pounds per cwt., $10.37 to $12 per cental. Milch cows $40 to $85, the latter for choice; veal calves, $8 to $11 per cental, live weight.

SHEEP.—$6.25 to $8.75, embracing all grades, from poor clipped to extra unshorn animals.

HOGS.—$6.50 to $6.75 per cental, live weight.

BOSTON.

CATTLE.—Choice beeves, $7.75 to $8 per cental; extra, $7 to $7.50; first quality, $6 to $6.50; second quality, $4.50 to $5.50; third quality, $3.75 to $4. Working oxen $100 to $250 per pair. Milch cows and calves, per head, $35 to $60; extra, $65 to $85; farrow cows, $20 to $30; yearlings, $10 to 18; veal calves, $5 to $15.

SHEEP.—$3.50 to $5 per head; extra, $5.50 to $8 per head, or $5 to $8.50 per cental; lambs, $6 to $8 per head.

HOGS.—Western fat hogs, $6 to $6.25 per cental, live weight.

PHILADELPHIA.

CATTLE.—Beeves in good request; choice and extra, $8 to $8.25 per cental; fair to good, $6 to $7.87½; common, $4 to $5.75.

SHEEP.—Wooled, $7 to $8.25 per cental; clipped, $5 to $6.25.

HOGS.—Corn fed, $9 to $9.25 per cental.

BALTIMORE.

CATTLE.—Best beeves, $6.25 to $7.62 per cental; first quality, $5.75 to $6.25; medium or good fair quality, $5 to $5.75; ordinary, thin steers, oxen, and cows, $4 to $5; general average, $5.75; extreme range, $4 to $7.62; most of the sales were between $5.25 and $6.25.

SHEEP.—Fair to good, wooled, $4.50 to $7 per cental, live weight; good to extra, $7 to $8; clipped, $4.25 to $6.25.

HOGS.—Still-fed, $7.75 to $8.25 per cental; corn-fed; $8 to $8.75; market bare and closing with good prospects.

CINCINNATI.

CATTLE.—Shipping, $5 to $5.50 per cental; extra, $5.75; common to choice butchers' stock, $3 to $5.40; inferior, $2 to $2.75.

SHEEP.—Extra, $6.25 to $6.50 per cental, gross; good to prime, $4.75 to $6; common to fair, $3.25 to $4.50.

HOGS.—Butchers' hogs, $5.60 to $5.90 per cental, gross; extra, $6; shipping grades, $5.15 to $5.50; stock hogs, $4.60 to $4.75.

CHICAGO.

CATTLE.—Extra graded steers, 1,400 pounds and upwards, $6.30 to $6.65 per cental, gross; choice beeves, fine, fat, and well formed, three

to five years old, 1,300 to 1,400 pounds each, $5.80 to $6.15; good beeves, well-fattened and finely-formed steers, 1,200 to 1,300 pounds each, $5.30 to $5.65; medium grades, $4.80 to $5.10; butchers' stock, $3.75 to $4.75; stock cattle, $3.40 to $4.40; Texans, north-wintered, $3 to $3.75; do., corn-fed, $4 to $5.

SHEEP.—Good to choice, $5 to $6 per cental; medium, $4.50 to $4.75; poor to common, $3.50 to $4.25.

HOGS.—Good to choice, $5.60 to $5.70 per cental; medium, $5.50 to $5.60; poor, $5.25 to $5.35.

NEW ORLEANS.

CATTLE.—Western beeves, per cental, net, $11 to $18; Texas beeves, corn-fed, first quality, $8 to $11 per cental, gross; second quality, $40 to $50 per head; Texans, not corn-fed, first quality, $35 to $45 per head; second quality, $20 to $28; third quality, $15 to $18; milch cows, $50 to $80 per head; choice, $80 to $100; calves, $8 to $12 per head; yearlings, $10 to $14 per head.

SHEEP.—First quality, $5 to $7 per head; second quality, $3 to $4.05; third quality, $2 to $2.10.

HOGS.—Seven dollars to seven dollars and fifty cents per cental, gross.

FOREIGN MARKETS.

WHEAT.—The weekly average prices of wheat in London, as reported in the Mark Lane Express, during March, were as follows: 55*s.* 11*d.* per quarter on 3,478 quarters; 55*s.* 8*d.* on 2,738 quarters; 56*s.* on 4,592 quarters; 52*s.* 10*d.* on 2,638 quarters; and 56*s.* 3*d.* on 4,983 quarters. The month opened with a heavy fall of snow, which, though favorable to the growing wheat crop, arrested field-labor for the time being. A mild temperature succeeded, but wintry weather again appeared about the third week. The month closed up with a week of very beautiful weather, giving opportunity for the field-labor which crops so greatly needed, both in England and on the Continent. British markets were dull, though prices were stationary at 1*d.* below those of the same period of the previous year. A heavy importation of foreign wheat, to which California alone contributed a half million quarters, gave assurance of a full supply until harvest, but the condition of the market was by no means cheering to speculators. Russia and Germany were not forthcoming with their usual supplies, yet the export business at Odessa was increasing. Stocks on hand in Europe and America were not large enough to create any special fear of a fall in prices. The home crop of 1872, though under average, had somewhat improved.

In Liverpool, American and European wheat was quite steady, at prices varying but little from those stated in our March report. The Paris market, at the close of March, was drooping, though some holders, in spite of the fine weather, maintained former values. The best white wheat had fallen to 59*s.* per quarter, from 63*s.* two weeks previous. Marseilles had also shown a strong downward tendency, with declining sales. Bordeaux was somewhat lower, (56*s.* 6*d.* per quarter for the best white wheat,) but the French country markets generally were unchanged. The Belgian markets had been firm, with some fluctuation in the middle of the month, but a rising tendency at its close. A decline of freights

had facilitated exports at Odessa, about 230,000 quarters having been sold during February.

FLOUR.—The standing quotations of the Mark Lane Express were the same as stated in our March report. In Liverpool prices had suffered no change. In Paris some decline was induced by the pleasant weather, giving better promise to the growing crops. Holders, however, were disposed to be firm, and but little superior flour was offering. Prices ranged from 42*s.* 3*d.* to 46*s.* 2*d.* per quarter.

INDIAN CORN.—In Mark Lane, London, white maize was quoted all through the month at 31*s.* to 33*s.* per quarter; yellow, at 26*s.* to 28*s.* In Liverpool, at the close of the month, American white brought 30*s.* to 31*s.* per 280 pounds; American yellow, 27*s.* 6*d.* to 28*s.*; Trieste, 30*s.*; Danubian, 28*s.* 9*d.* to 29*s.* 6*d.*; Galatz, 31*s.* to 31*s.* 6*d.*

WOOL.—The London market, at the close of the month, was not favorable to extensive operations in English wools. Fine qualities commanded attention and realized good prices. The standing quotations were the same as at the close of February, and had remained substantially unchanged during the month.

BUTTER.—The closing quotations were as follows: Dorset, 136*s.* to 144*s.* per cwt., showing a decline through the month; Friesland, 120*s.* to 126*s.*; Jersey, 112*s.* to 126*s.*

CHEESE.—American cheese brought 60*s.* to 76*s.* per cwt., about the same as at the close of February; English cheeses were generally lower; Cheshire, 60*s.* to 80*s.*; Double Gloucester, 79*s.* to 78*s.*; Cheddar, 76*s.* to 94*s.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

MAY AND JUNE, 1873.

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MONTHLY REPORT.

CONDITION OF THE CROPS IN JUNE.

WHEAT.

The returns for the month of June have been carefully examined, and a tabular exhibit of the results will be found below. From the following abstract it will appear that of 753 counties reporting in regard to winter-wheat, 283 report an acreage equal to that of last year; 263 an increased and 207 a diminished acreage. Of 300 counties reporting spring-wheat, 172 report an increased acreage; 77 an acreage equal to that of the previous year, and 51 a decrease. In New England, Maine reports a decrease of 10 per cent., Vermont 24 per cent., and Massachusetts 3 per cent. in winter-wheat. In spring-wheat they are all below last year except Maine, where the increase is 5 per cent. In the Middle States the acreage of winter-wheat is somewhat above that of last year. New York and Pennsylvania report a decreased acreage of spring-wheat, amounting to 5 per cent. In the South, Georgia is the only State reporting spring-wheat; the acreage here decreased 7 per cent.; the acreage of winter-wheat varied from 92 per cent. in South Carolina, Georgia, and Alabama, to 117 per cent. in Texas. North of the Ohio River the acreage of winter-wheat has increased to some extent, while that of spring-wheat exhibits a very considerable enlargement. The percentages of winter and spring-wheat, respectively, compared with last year, are, in Ohio, 102 and 85; Michigan, 105 and 109; Illinois, 94 and 127; Wisconsin, 104 and 101. Indiana reports an acreage of winter-wheat equal to last year's, but makes no returns of the spring-sowing. West of the Mississippi River the percentages are as follows: Minnesota, 102 and 134; Iowa, 85 and 121; Missouri, 98 and 125; Kansas, 138 and 141; Nebraska, 101 and 173. On the Pacific coast, California reports 111 and 115; Oregon, 107 and 110.

Acreage of wheat in 1873.

States.	Winter-wheat.			Spring-wheat.		
	Counties above average.	Counties average.	Counties below average.	Counties above average.	Counties average.	Counties below average.
Maine	.....	3	1	7	3	1
New Hampshire	1	3	1	1	4	2
Vermont	.....	1	3	1	5	4
Massachusetts	.....	3	1	.....	1	2
Rhode Island	.....	.....	.....	.....	.....	.....
Connecticut	1	3	.....	.....	1	1
New York	3	19	8	3	10	6
New Jersey	1	6	1	.....	.....	.....
Pennsylvania	10	22	5	2	3	5
Delaware	1	2	.....	.....	.....	.....
Maryland	3	12	.....	.....	.....	.....

Acreage of wheat in 1873—Continued.

States.	Winter-wheat.			Spring-wheat.		
	Counties above average.	Counties average.	Counties below average.	Counties above average.	Counties average.	Counties below average.
Virginia	23	21	20	.....	.....	.....
North Carolina	11	17	11	.....	.....	.....
South Carolina	1	10	4	.....	.....	.....
Georgia	10	12	24	.....	5	3
Florida	.....	.....	.....	.....	.....	.....
Alabama	2	4	9	.....	.....	.....
Mississippi	.....	5	2	.....	.....	.....
Louisiana	.....	.....	.....	.....	.....	.....
Texas	18	6	2	.....	.....	.....
Arkansas	11	3	7	.....	.....	.....
Tennessee	12	16	10	.....	.....	.....
West Virginia	8	12	3	.....	.....	.....
Kentucky	8	16	10	.....	.....	.....
Ohio	9	14	7	.....	2	5
Michigan	17	12	2	7	5	3
Indiana	16	17	15	.....	.....	.....
Illinois	11	12	19	20	7	3
Wisconsin	8	9	3	12	11	4
Minnesota	2	4	1	20	.....	3
Iowa	5	3	3	39	7	2
Missouri	23	9	23	10	4	3
Kansas	25	1	2	25	6	2
Nebraska	5	1	1	14	.....	.....
California	14	2	2	6	2	1
Oregon	4	3	.....	5	1	1
Total	263	283	207	172	77	51

The following table shows the condition and prospects of winter and spring wheat, respectively, about the 1st of June. Three States—Rhode Island, Florida, and Louisiana—make no returns of wheat-culture whatever, while in many counties of other States this branch of farming is so inconsiderable as to excite no remark. Some of the counties reported grow both winter and spring-wheat. Of 751 counties reporting the condition of winter-wheat, 202 are above average, 168 full average, and 381 below. Of 286 counties growing spring-wheat, 103 are above average, 115 full average, and 68 below. Judging from the relative proportions of the above figures, the prospects of spring-wheat at this date appear more flattering than those of winter-wheat, the former showing 218 out of 286 counties full average or above, while in the latter favorable reports came from less than half. The character of the winter-wheat crop is pretty nearly determined, but the spring-sowing is just at the inception of its career, and has the vicissitudes of a whole season yet before it. From the reports already received an active campaign with insect enemies is foreshadowed in portions of our wheat-growing area, the result of which it is impossible to anticipate. A very great increase of acreage and an encouraging prospect of spring-wheat are indicated in the Northwestern States.

Condition of wheat June 1, 1873.

States.	Winter-wheat.			Spring-wheat.		
	Counties above average.	Counties average.	Counties below average.	Counties above average.	Counties average.	Counties below average.
Maine	1	3	.....	1	7	3
New Hampshire	4	.....	1	1	3	2
Vermont	2	1	1	2	4	4
Massachusetts	1	2	1	1	1	1
Rhode Island	.....	.....	.....	.....	.....	.....
Connecticut	2	2	.....	1	1	.....
New York	5	13	12	1	8	10
New Jersey	2	3	3	.....	.....	.....
Pennsylvania	22	5	10	1	3	6
Delaware	1	1	1	.....	.....	.....
Maryland	5	3	7	.....	.....	.....
Virginia	11	10	43	.....	.....	.....
North Carolina	4	9	26	.....	.....	.....
South Carolina	1	5	9	.....	.....	.....
Georgia	9	11	27	2	2	4
Florida	.....	.....	.....	.....	.....	.....
Alabama	1	6	8	.....	.....	.....
Mississippi	1	1	5	.....	.....	.....
Louisiana	.....	.....	.....	.....	.....	.....
Texas	7	1	17	.....	.....	.....
Arkansas	11	5	5	.....	.....	.....
Tennessee	8	6	24	.....	.....	.....
West Virginia	10	2	11	.....	.....	.....
Kentucky	4	10	19	.....	.....	.....
Ohio	10	7	13	.....	4	2
Michigan	6	4	21	1	8	6
Indiana	8	14	25	.....	.....	.....
Illinois	7	10	25	13	9	8
Wisconsin	2	4	14	10	10	7
Minnesota	1	2	5	8	10	4
Iowa	2	.....	9	22	18	8
Missouri	23	14	17	8	6	2
Kansas	17	10	8	17	14	2
Nebraska	3	1	3	8	4	2
California	5	2	11	2	2	5
Oregon	6	1	.....	4	1	2
Total	202	168	381	103	115	68

In June, 1872, the indications of the wheat-yield of the United States pointed to an aggregate of 220,000,000 bushels. The final estimates for that year, prepared for the annual report, as yet unpublished, amounted to 249,997,000 bushels, the subsequent conditions of growth being more favorable than they appeared just before harvest. This aggregate was but 11,000,000 below the extraordinary yield of 1869. The acreage of wheat reported is largely in excess of last year. Of winter and spring wheat combined, 340 counties report an acreage equal to last year's, 360 an increased, and 258 a decreased acreage. As to condition, 383 report full average, 305 above, and 449 below. Upon a careful estimate of all the conditions of growth as yet apparent, the wheat-prospect is at least as favorable as at this time last year, when the yield was estimated at 220,000,000 bushels. With equally favorable conditions for the remainder of the season, a crop of 250,000,000 bushels may be expected.

In New England the winter was generally favorable to winter-wheat, the snow in many localities affording an excellent shelter against atmospheric injuries. The general condition is above average, but in spring-wheat the balance appears to be in the other direction.

In the Middle States several instances of winter-killing are noted, but in other localities winter-wheat is much more promising, the condi-

tions of growth having improved since the opening of spring. Pennsylvania reports a heavy preponderance of counties above average; but in New York and New Jersey the general indications are not so favorable. Neither New Jersey nor Delaware report any spring-wheat, which branch of culture appears to be quite limited and below average in New York and Pennsylvania. On the whole, the wheat-crop of the Middle States is somewhat above average.

In all the South Atlantic and Gulf States the general condition of the crop is below average. Virginia reports 43 counties below average, to 10 full average, and 11 above. North Carolina 26 below, against 13 average and above; 8 counties in Georgia report some growth of spring-wheat, of which 4 are below average. Of the interior Southern States, Arkansas is above average, while Tennessee, Kentucky, and West Virginia are below. North of Ohio River the reports of winter-wheat are below average; Ohio shows 10 counties above average against 13 below; Michigan 6 above and 21 below; Indiana 8 above and 25 below; Illinois 7 above and 25 below; Wisconsin 2 above and 14 below. In spring-wheat, however, these States present a much more promising prospect. Illinois shows 13 counties above to 8 below; Wisconsin 10 above to 7 below.

West of the Mississippi, Minnesota presents in spring-wheat 8 counties above average to 4 below; Iowa, 22 to 8; Missouri, 8 to 2; Kansas, 17 to 2; Nebraska, 8 to 2. In winter-wheat these States show 45 counties above average to 44 below, with a large proportion of full average counties. On the Pacific coast, California reports 7 counties above and 16 counties below average; Oregon 10 above against only 2 below.

MAINE.—*York:* Wheat looks well.

CONNECTICUT.—*Hartford:* Covered with snow all winter; it came out good.

NEW YORK.—*Livingston:* Looking very poor. The winter was long and cold, with but little snow; badly winter-killed. *Wyoming:* Has improved very much in the last ten days. *Genesee:* Injured when spring opened; weather unfavorable since. *Ontario:* Badly winter-killed.

NEW JERSEY.—*Warren:* Very promising.

PENNSYLVANIA.—*Clinton:* Very promising. *Westmoreland:* Much winter-killed; growth very uneven. *Washington:* Winter-killed to some extent, but early rains pushed it forward, causing it to stool much better than for several years. *Union:* Winter-wheat looks splendid. *Montgomery:* Very promising. *Chester:* Doing well wherever there is a good stand. *Berks:* Looks remarkably well. *Bucks:* Looking unusually well. *Northumberland:* Looks unusually fine. *Lancaster:* Prospect for a good crop all over the county. *Cambria:* Beginning to show well. Spring-wheat very backward on account of the cold, wet spring. *Lycoming:* Looking remarkably well. *Greene:* Winter very hard on wheat. Spring favorable. *Fulton:* Very seriously injured by the fly, which has not been so bad for many years.

DELAWARE.—*Sussex:* Quantity sown very small; no spring-wheat. *Kent:* Badly winter-killed on low ground; looks well on land thoroughly drained; complaint of injury from the fly in some parts of the county.

MARYLAND.—*Saint Mary's:* The late May rains have greatly improved the prospect of wheat. *Howard:* Promises an average crop. *Washington:* Was very promising until within the last eight or ten days. The fly and joint-worm are now making great destruction. *Caroline:* Looking well except on low and wet land, where it is very badly winter-killed. Drilled wheat stood the winter better than that sown broadcast. The new red wheat from the Department very promising. Fultz wheat looking well. The winter hurt the Touzelle considerably. The Russian bearded white wheat (the second year from the Department) promises to be a great acquisition; it is quite hardy, standing the winter as well as any other variety. *Baltimore:* Crop presents a luxuriant appearance; slight injuries by the fly on late-sowed fields. *Cecil:* In many fields thin, but growing finely. *Queen Anne:* Winter-wheat now in bloom; heavy growth of straw, and promise of fine yield.

VIRGINIA.—*Botetourt:* Now looking well, but much of it winter-killed. *Powhatan:* Many complaints of fly in wheat; high lands will probably produce an average; low lands fall short. *Spottsylvania:* The crop has continued to improve; the plants very strong and healthy. *Pulaski:* Improving rapidly, but cannot make over one-third of a crop. *Fluvanna:* Has suffered great injury from winter-killing, also from spring-fly;

some early-sown very good, but general average bad. *Caroline:* Notwithstanding the severe winter, the Fultz and the Touzelle wheat promise a good yield. *Hanover:* The last winter was severe on our winter-wheat; consequently its condition is inferior to that of the former crop. *Lunenburg:* Prospect fair for an average crop. *Montgomery:* On northwestern exposures wheat was badly injured by extreme freezes in the latter part of winter—large bodies entirely killed; the cool, wet spring has been favorable, and the crop remaining improves beyond expectation. *Madison:* Improves since the last report, but looking badly still; much complaint of the fly. *Orange:* The cold, wet spring retarded the growth so as to afford every opportunity for depredation to the fly, which has been more destructive than for many years: the severe freeze in the early part of March also greatly thinned the plants. *Cumberland:* Looking badly; much of it winter-killed. *Culpeper:* Very much injured by fly and severe winter. Fultz wheat superior to any other variety. *Greeneville:* Only half a stand of wheat at the opening of spring, and now some fields are badly struck with rust; some drilled fields are looking well. *Halifax:* The Fultz wheat from the Department succeeds admirably; it is by far the best of all kinds, being early, hardy, and very prolific. *King George:* Has improved with refreshing rains, but many thin and bare spots remain; some reduced by fly. *Nelson:* Has improved very much since the 1st of May, but in some localities is now giving way rapidly to the ravages of the Hessian fly. *Clarke:* Prospect has improved very much since last report, and, although the severe winter and Hessian fly will prevent a full average crop, it will be better than that of last year. *Henrico:* Crop short—fully one-tenth. *Loudoun:* General complaint of fly in wheat. *Nansemond:* Considerably less wheat sown; many going into cotton. *Page:* The failure of our wheat-crop is owing in part to early sowing, it being very dry and warm in September; this gave the fly every advantage; it continued to work during the fall. *Prince George:* Rust has appeared on the blades, which must reduce the yield 15 per cent. *Rockingham:* Badly crippled by the fly and injured by the winter; cannot make a half-crop. *Washington:* Badly winter-killed. *Mecklenburg:* On the river-bottoms has been destroyed by freshets; on the high lands indifferent. *Grayson:* The hard freeze the 1st of March killed a large per cent. of the wheat; the favorable weather since is improving it very much. *Alexandria:* Considerably winter-killed; the frequent rains this spring have brought it out wonderfully; now remarkably good where there is a stand. *Chesterfield:* Injured to some extent by the continued rains of May. *Highland:* Greatly injured by winter-freezing. *Lancaster:* Looks remarkably well; no rust. *Westmoreland:* On well-drained upland winter-wheat above average; on low grounds and river-bottoms much winter-killed; rust has appeared on the blade, but not on the stalk; seems to be filling well; will be harvested by the middle of June.

North Carolina.—*Mitchell:* The Touzelle furnished by the Department is almost an entire failure; the Tappahannock looks better than any other variety. *Lincoln:* A severe frost on the 24th and 25th of April injured the wheat-crop. *Cherokee:* Froze out last winter worse than heretofore. *Davie:* Damaged by frost in April, and by wet in May; will not make more than three-fourths of a crop. *Hartford:* Bids fair to make a good crop. *Haywood:* Wheat winter-killed badly. *Rowan:* In low grounds badly damaged by high water. *Caldwell:* A large proportion of the crop destroyed by being winter-killed. *Ashe:* Badly injured by the winter freeze. *Anson:* Injured seriously by the wet spring. *Greene:* The extremely cold winter, cold, wet spring, and heavy rains have made the crop a failure. *Union:* Dry weather and heavy frost the last of April injured the wheat. *Polk:* The quality promising, but generally thin on the ground. *Montgomery:* Badly damaged by the frost April 26; also by the late heavy rains and freshets.

South Carolina.—*Greenville:* Wheat sown late last fall failed very much; that sown the first week in October will make a good crop. The straw is short. *York:* Suffered greatly from the intensely cold and variable weather of last winter. Where the stands are full, the crop is nevertheless a failure. *Union:* Now turning, and will be ready to reap by the 12th instant.

Georgia.—*Madison:* Thin and sorry. *Marion:* Clearer from rust than for many years. The Tappahannock wheat from the Department is doing well. The Touzelle does not suit this climate; is not worth gathering. *Floyd:* Badly winter-killed, thin, and low. *Cobb:* Crop very unpromising, owing to winter-killing and excessive rains. *Murray:* Worse winter-killed than I ever saw it before. *Jackson:* Killed out during the winter; poor stand and bad condition. *Sumter:* The Tappahannock wheat promises well. The Touzelle so far is extraordinarily fine—ahead of any wheat ever grown in this county.

Florida.—*Jackson:* The plant has matured fully, developing a fine, full, heavy head

Alabama.—*Saint Clair:* The Tappahannock wheat grows finely here. I think it is the wheat for the South. *Blount:* Prospect worse than for many years; stand thin straw short; two weeks later than usual, and therefore much danger of rust. *Calhoun:* Much later than usual; now beginning to ripen. *Randolph:* The Tappahannock, Red England, and Arnautka wheat the best in the county.

MISSISSIPPI.—*Dooly:* Very fine. *Granada:* Considerably damaged by late excessive rains, resulting in rust.

TEXAS.—*Blanco:* The crop, which was more promising than in any previous year, now entirely destroyed by late frosts and grasshoppers. *Bosque:* Badly damaged by frost on the 26th of March. *Hays:* The small quantity sown has been destroyed by grasshoppers. *Grayson:* The prospect poor before the hail-storm, May 16, which destroyed at least one-fourth the crop. *Palo Pinto:* Greatly damaged by grasshoppers; in fact, almost totally destroyed. *Titus:* Was supposed to be damaged by late freeze, but those who pastured late have a fine prospect for a heavy crop. *Dallas:* Our farmers are just beginning to harvest their wheat, and the yield will be above average. *San Saba:* The grasshoppers have destroyed the wheat, *Coryell:* The 1st of March, wheat promised a splendid yield, but on the 18th there came a terrible freeze, which killed almost everything green. Farmers think they will have something over half a crop. *Burnet:* Injured by frosts and grasshoppers. *McLennan:* Now being harvested. *Medina:* Winter and spring wheat entirely destroyed by grasshoppers; not a bushel will be raised in the county. *Hunt:* Prospects injured by continued heavy rains from the 17th to the 28th of May. *Williamson:* Promises better than average. *Gilmer:* Injured by drought.

TENNESSEE.—*Anderson:* One-fourth of the wheat froze out. *Loudon:* Have never seen so poor a prospect. *Sumner:* Crop promises well. *Smith:* Prospect has wonderfully improved within the month. *Jefferson:* Injured by freezing and wet weather; thin and short stems. *Montgomery:* Freezing out and late planting make a very thin stand. It is taking rust everywhere. Fultz wheat stood the winter well, and promises well. *Greene:* Much frozen out after winter closed, and otherwise unpromising. *Marion:* Crop worse than ever known. *Humphreys:* Much killed out by winter-freezes and high water. *Gibson:* Favorable season for wheat. *Giles:* Rather thin on the ground, but doing well. *Grainger:* A failure. *Hancock:* Considerably winter-killed.

WEST VIRGINIA.—*Mercer:* Winter-wheat badly frozen; crop cannot be anything like an average. *Jackson:* Winter-wheat badly frozen, but improving under the wet and cloudy spring. *Braxton:* Winter hard on all varieties except the Fultz, which stands remarkably well; prospects now encouraging. *Nicholas:* Wheat looks well. *Pendleton:* Fine weather bringing out the small grain. *Monroe:* Frozen out. *Tyler:* Much injured by frost. *Mineral:* Badly frozen out. *Harrison:* Badly winter-killed. *Pocahontas:* Winter-wheat fine on uplands.

KENTUCKY.—*Shelby:* Winter-wheat badly frozen out; looks well, though thin on the ground. *Laurel:* Wheat largely winter-killed; what is left looks well. *Taylor:* Wheat badly winter-killed. *Fayette:* Thin, but healthy. *Hardin:* Looks badly; heading low. *Lincoln:* No improvement. *Graves:* Damaged 25 per cent. by wet. *Edmonson:* Badly winter-killed in many places: *Nicholas:* Winter-wheat looks badly; thin on the ground, and liable to rust; cannot be more than half a crop; no spring-wheat sown.

OHIO.—*Gallia:* Bad stand generally, but some very good; considerable lodging. *Jackson:* Never looked better. *Athens:* Short crop of winter-wheat sown on account of dry fall; crop now promising. *Warren:* Grains excellent. *Carroll:* Wheat better than was expected. *Sandusky:* Winter-wheat badly injured by wet spring. *Adams:* Wheat has thickened up very rapidly, and is now heading out.

MICHIGAN.—*Kalamazoo:* Winter-wheat badly frozen out; what escaped is nearly average. *Branch:* Wheat not doing well; not over three-fourths of a crop; harvest will be twenty days late. *Genesee:* Decreased acreage of spring-wheat. *Oakland:* Wheat growing well, but does not realize expectations. *Calhoun:* Looks well where not winter-killed. *Washtenaw:* Below average. *Barry:* Wheat severely frozen. *Cass:* Many patches winter-killed; others entirely escaped injury. *Clinton:* Wheat badly winter-killed.

INDIANA.—*Decatur:* Wheat did well up to the melting of snow in February, but one-half was killed by the hard cold weather of March; the warm showers of May have caused it to stool out very freely. *Grant:* Wheat quite tall. *La Porte:* Wheat recovering from injuries of winter. *Noble:* Wheat that has escaped injuries of winter is doing well. *Huntington:* Wheat badly winter-killed; spring-wheat looks well. *Carroll:* Wheat improving. *Ripley:* Wheat growing fast and beginning to head; in danger of rust. *Hamilton:* Earlier sown wheat beginning to head. *Pike:* Spring-wheat from the Department grows tall and looks well, but threatens to fall down. *Brown:* Quite unpromising, through dry fall, late sowing, and unfavorable spring. *Dearborn:* Wheat varies, but is, on the whole, 15 per cent. below average; that sown on corn-ground limited by the bad condition of the fields. *Newton:* No spring-wheat sown, as it is usually eaten by chinch-bugs, which are thought to propagate more readily in spring-wheat and barley than in any other grain; winter-wheat almost entirely winter-killed. *Parke:* Wheat sown early in September is very good, but ten days late; about six-tenths of the wheat was sown in October, and will scarcely repay the seed and labor. *Dubois:* Thin; some fields plowed up for corn.

ILLINOIS.—*Kankakee:* Winter-wheat killed by extreme cold in April. *De Kalb:* Winter-wheat, both drilled and broadcast, nearly killed out; in many places not over 10 per cent. left. *Winnebago:* Increased proportion of spring-grain. *Pope:* Badly winter-killed; not over a half-crop. *Williamson:* Poor stand of winter-wheat. *Jersey:* Growing very rank. *Wabash:* Rank growth; on rich soils it will lodge badly. *Randolph:* Prospect good; spring rains have lengthened the straw. *Saint Clair:* Probably not over a half-crop will be thrashed; harvest will be two weeks late, and late harvests have never been copious. *McLean:* More spring-wheat would have been sown if seed had been accessible. *Ogle:* Winter-grain largely winter-killed. *Perry:* Chinch-bugs in the wheat. *Putnam:* Winter-wheat mostly winter-killed. *Scott:* Wheat drilled in early looks well; broadcast nearly all winter-killed. *Henry:* Spring-grain good. *Hancock:* Crops mostly thin. *Bond:* Largest and best crop ever grown; earlier sown fields well headed but beginning to lodge.

WISCONSIN.—Large breadth of winter-wheat sown, but 60 per cent. of it winter-killed. *Juneau:* Spring-wheat promises an abundant crop; winter-wheat badly killed out. *Jefferson:* Badly winter-killed. *Walworth:* Small grain backward, but green and promising. *Dodge:* About 25 per cent. of the winter-wheat re-sown on account of winter-killing; most of the residue looks well. *Fond du Lac:* Spring-wheat on the prairies destroyed by an insect; in the openings the soil is more compact and furnishes less scope of mischief. *Sheboygan:* Winter-wheat largely winter-killed, and replaced with spring-wheat. *Calumet:* Winter-wheat unpromising. *Waupaca:* Winter-wheat extensively sown, but without regard to condition of soil; hence 75 per cent. re-sown with spring-wheat. *Brown:* Winter-wheat killed to some extent.

MINNESOTA.—*Faribault:* Spring-wheat impaired by excessive rains. *Dodge:* Wheat sown in March; some of it looks remarkably well; wheat acreage double that of all other grain. *Steele:* May favorable for grain. *Winona:* Increased acreage of winter-wheat, of which three-fourths were winter-killed. *Cottonwood:* Looks well. *Goodhue:* Spring-wheat sown late but promising.

IOWA.—*Clinton:* Winter-wheat all killed. *Powieshiek:* All sorts of grain backward. *Muscatine:* Badly winter-killed. *Louisa:* Fall-wheat badly frozen out. *Marion:* Wheat badly winter-killed; much of the ground replowed; winter-wheat all killed, but little sown. *Delaware:* Weather good for small grain. *Johnson:* Wheat looks well. *Ringgold:* Winter-wheat badly winter-killed; spring-wheat very promising. *Howard:* Wheat wintered in the stack and thrashed this spring did not grow well; some fields had to be re-seeded; wheat generally is stooling finely and will give heavy crops of straw. *Buena Vista:* Wheat a fine stand, but beginning to turn yellow. *Des Moines:* Winter-wheat nearly all winter-killed; drilled as bad as broadcast. *Mitchell:* Small grain looks well; very little winter-wheat raised. *Lee:* Spring opened favorably for small grain, which was sown in good condition, and looks well.

MISSOURI.—*Benton:* Chinch-bugs threatened to destroy the wheat in some sections. *Polk:* Very fair crop promised. *Crawford:* Full average. *Caldwell:* Winter-wheat reported killed in exposed localities. *Boone:* Chinch-bugs just begining to destroy the wheat. *Cass:* Very little spring-wheat; winter-wheat looks fine, promising a large crop. *Greene:* Small grains greatly improved by late fine weather, but harvest will be two weeks late. *Vernon:* Wheat badly beaten down by hail. *Moniteau:* Looks finely. *Franklin:* Chinch-bug destructive on upland clay soils. *Stone:* Damaged by frost and Hessian fly; crop twelve to fifteen days late. *Perry:* Generally thin. *Pulaski:* Attacked by chinch-bugs. *Nodaway:* Wheat looks splendid. *Jasper:* Chinch-bugs destructive. *Maries:* About a third of the winter-wheat winter-killed and plowed up; a third badly injured by the Hessian fly; another third looks fine. *Jackson:* Winter-wheat never gave fairer promise.

KANSAS.—*Doniphan:* Wheat promises an abundant yield. *Washington:* Spring-wheat unusually good; rain greatly improved winter-wheat. *Wabaunsee:* Touzelle wheat a failure; will not stand the weather. *Cherokee:* Harvest in fifteen or twenty days; drilling preferable, and that very early. *Riley:* Winter-wheat but two-thirds of a stand; some fields entirely killed. *Neosho:* Looks fine, but is full of chinch-bugs. *Labette:* Fine; no chess; few complaints of insects. *Linn:* Winter-wheat very fine. *Republic:* Badly winter-killed, and largely plowed up for corn. *Marion:* Spring-grain never looked better. *Bourbon:* Chinch-bugs in wheat. *Cloud:* Spring-wheat replacing winter-wheat, frozen out. *Coffey:* Harvest will be two weeks late. *Reno:* Wheat sown in August looks well; later sowing almost a failure.

NEBRASKA.—*Burt:* Winter-wheat entirely frozen out. *Cass:* Wheat growing very rank. *Gage:* Wheat lodging badly. *Thayer:* Badly winter-killed, especially where sown after September 15. *Cuming:* Wheat attacked by the red-legged locust.

OREGON.—*Lane:* Large amount of wheat sown. *Clackamas:* Wheat had a fine start, but was cramped by late dry weather. *Douglas:* All kinds of small grain promise splendid crops.

CALIFORNIA.—*Alameda:* Grain injured by frost and drought, there being no rain since February; thousands of the best acres of wheat will not pay for harvesting. *Contra Costa:* Superior on heavy, well-cultivated soils, but on sandy and late-sown

fields only a half-crop will be raised. *Stanislaus:* Crop but one-third of an average. *Mendocino:* Late-sown grain still looks well, but will soon show the effects of drought. *Placer:* Wheat-crop threatened by drought.

COTTON.

Twelve months ago an increase over the previous year in the cotton-area was reported in every State; an increase over that of last year is now reported in every State. The percentage of increase in a State, as found by dividing the aggregate of increase in counties by the number reported, is, as a rule, too high, because, almost always, the largest per-cent. of increase will be from counties having a comparatively small acreage. But, reckoned in that rough way of estimating, the increase indicated is, in Virginia, 23 per cent.; North Carolina and Georgia, 14; South Carolina, 2; Florida, 3; Alabama, 9; Mississippi and Louisiana, 4; Texas, 31; Arkansas, 10; Tennessee, 15. This makes the average increase in the cotton States, reckoned in the same way, nearly 12 per cent. The per cent. of increase reported last years was, in North Carolina and Arkansas, 16; South Carolina, 9; Georgia and Tennessee, 12; Florida and Mississippi, 10; Alabama and Louisiana, 11; Texas, 18; and the average, throughout the cotton States, approximating 13. It will be noticed that, in both years, Texas makes the largest relative increase. Our reports indicate a prevalent increase in the relative amount of fertilizers used. The acreage *cultivated* will fall considerably below that *planted*. A cold, backward spring, causing much seed to rot in the ground; a very wet May, preventing work, and increasing the subsequent demand for it; and the impossibility of obtaining sufficient labor to subdue, over the whole breadth sown, the excessive weeds and grass consequent upon the extraordinarily wet season, conspire to make this result inevitable. Returns concur in placing the crop from two to three weeks later than usual.

Florida reports a condition 2 per cent. above annual average; all the others fall below. Virginia and Alabama, 7 per cent.; North Carolina, 15; South Carolina, 12; Georgia and Louisiana, 6; Mississippi and Arkansas, 8; Texas, 14; Tennessee, 10. But it will be seen, from the extracts below, that very generally the weather, in the last days of May, was favorable, and there was a hopeful prospect that the condition would rapidly improve.

Another part of this report will show that worms and caterpillars have made an early appearance at various points, and are causing considerable apprehension of destructive ravages.

Virginia, from which four counties reported the culture of cotton last year, reports eight this year, and an increase of acreage in all except Patrick, Chesterfield, and King William, in which it is unchanged. In Sussex and Nansemond the increase is 50 per cent.; in York, 70.

Nansemond: Many going into cotton; the crop very late. *Prince George:* The acreage has been increased, but the cold, heavy rains have caused the seed to come up badly, and the plant does not look thrifty. *Southampton:* The acreage greatly increased, from the fact that the pea-nut crop has been almost abandoned, and cotton substituted.

From the thirty-two counties reporting from North Carolina, Catawba, Cumberland, and Union report a decrease in acreage; Wake, Tyrrel, Iredell, Yadkin, Anson, and Montgomery, the same as last year; the others, an increase; Lincoln and Granville, 100 per cent.; Lincoln, Gates, Randolph, Stanly, and Martin return average condition; Polk, 25 per cent. above; all the others below.

Lenoir: The heaviest rain we have had for many years, on the 21st of May, washed up the cotton, which will have to be replanted. *Chowan:* Looks bad; too cold and wet; great complaint of seed rotting in the ground; numbers have plowed up and planted again. *Pitt:* Plant looks bad, but present warm weather is bringing it out. *Bertie:* Cotton that was planted early enough to come up by the 1st of May has suffered much from the ants and "Collard worms," and has required replanting. *Hertford:* Planting much delayed by excessively rainy spring; crop looks well. *Cumberland:* Backward and bad stand. *Franklin:* Large quantities of fertilizers have been purchased and applied chiefly to cotton. *Sampson:* Freshet after freshet has filled our streams, so that the low banks are yet under water in many districts; our cotton-crops are in bad order; bad stands have caused many to plow up and plant again. *Rowan:* Grassy and sickly-looking. *Beaufort:* The prospect gloomy; cool wheather and heavy rains, during May, caused the seed to come up badly, and much of that which came up is dying out. *Anson:* Seriously injured by the remarkably wet spring. *Greene:* Nearly all killed by frost, April 25. *Perquimans:* More planted than last year. Cold and rain from the 1st to the 20th of May caused most of the early planted to be lost. The replanted not yet up. *Polk:* More planted and more advanced than last year. *Jones:* Early killed by frost. Owing to cold rains, cotton has died out, and in some places farmers have planted over more than once, making the crop very late. *Stanly:* The growth on hand, all produced since the frost in April, in very promising condition. *Bladen:* Looks sorry.

Among the counties reporting from South Carolina, ten return a small increase in acreage, and two, Barnwell and Marlborough, a small decrease. Union and Richland report average condition; York, 6 per cent. and Fairfield 25 per cent. above; the remainder less than average.

Darlington: Killed by frost and ice, April 26. Much to be replanted; two weeks later than usual. More fertilizers by 20 per cent. than usual. *Fairfield:* Good stand; much better than last year, but recently injured by too much rain. *Greenville:* Seed germinated very slowly; the stand, so far, very bad. *Williamsburgh:* Frosts killed the early cotton; the rains have prevented work fully one-fourth of the time; we have been unable to plow or hoe from the excessively wet and boggy condition of the land. Now the cotton is very grassy, and with a scarcity of labor it will be impossible to put it in growing order in time to make even a moderate crop. *Orangeburgh:* Four weeks later than last year, and injured by heavy rains. *York:* Looking well, but, owing to two weeks of rain in the latter part of May, it has not been well worked. Some fields have been abandoned on account of the grass. Many plowed up the crop—grass and all—as the best means of exterminating the grass, and replanted. The plants are vigorous, stands good, and, where labor has been sufficient to keep up with the grass, the crop promising. *Richland:* Stand generally very good. The grass is getting ahead of the *poor* farmer, but the wide-awake ones have no uneasiness. *Newberry:* The killing frost of April 26 destroyed much of the early cotton. Stands planted later are good, but the grass has destroyed crops in much of the wet cotton-lands. *Marion:* Bad stands and "ruinously" in the grass. If it is ever redeemed, it will be a triumph of free labor. *Chester:* Good stands were up May 15. The plant died out on sandy soils on account of excessive rains. Many of the fields present the appearance of luxuriant meadows; the stands will be reduced to three-fourths, and some to one-half, of a regular stand, by cleaning out the grass. *Marlborough:* The early planted killed by frost April 26; replanting went on until the grass forced planters to abandon it, and, with too much rain and no reliable labor, it has been a hard struggle with bad stands of cotton and flourishing stands of grass. *Edgefield:* Cannot be worked as it should be on account of rain, but prospect better than last year. *Union:* Pretty fair stand, but much grass, owing to increased acreage, heavy rains, and over-cropping.

Fifty-three counties are reported from Georgia. Dooly, Richland, Schley, and Troup return each a decrease in acreage of 5 per cent., and Decatur of 10 per cent. Twelve counties return the same as last year; the remaining thirty-six report an increase; Gordon, of 100 per cent.; Catoosa, Cobb, and Walker, of 50; Forsyth, of 40; and Sumter, of 30. Twenty counties return for condition 100, or average; Worth, 130; Twiggs, 125; Whitfield, 120; Butts and Hart, 110; Douglas, 105; and Spalding, 103. Six return a condition of 80, 7 of 90, and 6 of 95; the others reported range between 60 (Laurens) and 98.

McDuffee: Last year a majority had finished chopping out their cotton at this date; this year very few have commenced, and a great many have not finished planting, owing to the cold, dry spring. *Lincoln:* An unusual amount of fertilizers bought and used on the cotton-crop this year. Plant late, but good stands. *Douglas:* Very good stands

Muscogee: Small and backward; bad stand in many places, in consequence of cool weather, heavy rains, and hail-storms. *Richmond:* Generally very grassy; labor scarce and much needed. *Calhoun:* Injured by hail-storms and cold weather. *Liberty:* Badly in grass and weeds from daily showers. *Laurens:* Materially injured by the heavy rains and cold weather; much of it has died from frost and cold winds. *Madison:* Good stand, though very late, owing to cold, dry spring. *Decatur:* Cotton-caterpillars seen on Flint River May 30. *Coweta:* In bad condition, owing to thirty-two days of wet weather; from present appearances, 20 per cent. of the crop will be lost. *Troup:* Very late cold weather in the spring caused late planting, and recent heavy and frequent rains render it impossible to keep the small plants from being smothered out by the great crop of "crab-grass;" some are contemplating plowing up and planting with corn. *Orange:* Backward, owing to the heavy frost in March, which killed much of the early planting, and to the long dry spell in April; the plant now growing finely. *Milton:* Late planted and very small; the last three weeks being very rainy, the grass beats the cotton in growing. *Heard:* Looks finely. *Wilkes:* The extremely dry April, the late frost, April 25, and heavy rains through May, place cotton at a great disadvantage; planters are already dropping a part of their crops. *Fayette:* The grass is getting the upper hand, and the prospect is that a considerable part of the crop will be lost. *Jackson:* Looks well and good stand.

In Florida three counties, Columbia, Alachua, and Levy, report each a decrease of 10 per cent. in acreage; and six an increase ranging from 10 to 25 per cent. In Madison and Clay the condition is 25 per cent., in Taylor, 30, and in Wakulla, 10 above; in Jackson, Jefferson, and Hamilton, average; in the others reported, below.

Jackson: The plant is some weeks behind in size and condition, but the weather is favorable. The caterpillar has already put in an appearance, some twenty days earlier than last year. *Wakulla:* Better stand than last year; crop promising. *Suwannee:* Bad stand, from defective seed and irregular spring; cut-worms doing great damage. *Jefferson:* The crop looks beautifully.

From Alabama, Hale reports 10 per cent., and Lauderdale 5 per cent. decrease in acreage; sixteen counties report an increase ranging from 5 to 50 per cent.; the others heard from report the same as last year; Coffee reports a condition 25 per cent., and Clarke and Geneva, 10 above average; Bibb, Winston, Saint Clair, Randolph, Dallas, Calhoun, and Jefferson, average; the remainder below, the range being from 5 to 20 per cent., Barbour, Macon, Limestone, and Conecuh standing at the latter figure.

Saint Clair: We had a severe frost on the morning of April 25, but as the ground was dry, cotton was not generally up, and hence was not much injured. *Lauderdale:* Good stands of cotton up several weeks ago, but most of it has been lost by cut-worm and flea-bug; has been replanted, and is not yet up; will be too late to make a full crop. *Blount:* Much more planted than usual. *Crenshaw:* Beginning to grow and look healthy, though smaller than at this date last year. *Limestone:* Fully two weeks behind, owing to late cold and dry weather; plants small but healthy. *Montgomery:* The appearance of the plant not so promising as usual on the 1st of June, but the warm and showery weather now prevailing will probably bring it forward rapidly. *Macon:* Seriously injured by the rains; very grassy, and we still have rains which keep it from being cleaned; the plant unusually small. *Conecuh:* Stand not so good as last year; late rains have caused the grass to grow faster than the farmers can master it. *Dallas:* Season propitious and the cultivation better than usual. *Autauga:* Very backward and much of it badly in grass, owing to too much rainy weather during May; good stands. *Morgan:* On bottom-lands much injured by cut-worms; some fields so much that they are being planted in corn. *Bullock:* Seriously injured by late frosts.

Twenty six counties report from Mississippi. Holmes returns a decrease in acreage of 5 per cent. Eleven return the same as last year, and fourteen an increase; Lee of 20 per cent., Rankin, 15 per cent., Yalabusha, Tishemingo, Sunflower, Le Flore, Coahoma, Attala, and Jefferson, 10 per cent; Bolivar reports a condition of 125; Rankin, 108; Amite, Yalabusha, Le Flore, and Granada, 100; the remainder range from 95 to 75.

Warren: Much of the cotton planted the 15th to the 20th of March, was killed by frost 15th and 16th of April; the remainder puny, and suffering from cut-worms. The later planted more promising. *Lee:* Cold and wet, and cotton not all chopped the first time yet. *Dooly:* Looking bad, in consequence of heavy hail-storms, too much rain, and too cool mornings. *Hart:* Good stand and in a healthy condition. *Grenada:* Considerably damaged by the excessive rains of late; grass, weeds, and an unhealthy condition of the plant are the consequences. *Tishomingo:* Weather now very favorable to cotton. *Neshoba:* Looking very bad; bad stands, caused by an unusually cold, wet spring. *Coahoma:* Too wet to plow all through May; cotton dying out in many places; grass abundant. *Rankin:* Spring late, but warm, and with rains so frequent as to hinder the working of the cotton-crop. *Noxubee:* Good stands, but bad condition; too much rain. *Attala:* Stand good; looks well, but the heavy rains for the last two weeks have damaged the prospect, grass and weeds having taken possession. *Madison:* Crop two weeks later than usual, but looking healthy. *Clark:* From the cold and dry weather in April, and the excessive amount of rain (9.4 inches) in May, the condition of the cotton-crop could not be other than bad. *Bolivar:* Prospect very fine. *Marion:* Crop generally rather late. *Jefferson:* Late and grassy.

From Louisiana nine parishes report no change from last year in acreage, and nine an increase. Morehouse, Washington, and Tangipahoa return an increase of 25 per cent.; East Feliciana a decrease of 10 per cent.; and Cameron of 25 per cent. Eight parishes return average condition; Assumption 5 per cent. and Winn 10, above; the others from 5 to 25, below.

Richland: Spring cold and backward: April very dry; as a consequence, cotton later than usual; stand poor in some places; prospect 10 per cent. below average. *Terre Bonne:* But little grown in this county. *Washington:* A heavy increase of acreage this year; prospect of a crop favorable. *Franklin:* In fair condition; about two weeks later than usual. *Claiborne:* Late, owing to cold spring. *West Feliciana:* The season not so favorable for cotton as the last: April cold and dry, and May too wet; the crop grassy. *Rapides:* Two weeks later than last year; covered with the apides and very grassy.

Reports have been received from thirty-nine counties in Texas. Among these the only one returning less acreage than last year is Fort Bend, which reports a decrease of 50 per cent. But it would seem that this figure refers to the area which, June 1, promised to yield a crop rather than to that planted. The report says: "The only crop we raise worthy of notice, cotton, is less promising than for many years. Twice killed by frosts, a stand was not obtained until about the 1st of May; since then rains have been so frequent that but little work could be done. The growth of grass and weeds has been rapid, and labor cannot be had. A large portion of the crop has been, and more will be, abandoned." Seven counties report the area the same as last year, and all the others an increase; Cooke, of 700 per cent.; Fort Bend, Kendall, Grayson, and Atascosa place the condition, each, at 50; Austin at 60; Tarrant, Smith, and Washington at 75; Rusk, Upshur, Hunt, Coryell, Henderson, Red River, Milan, and Hays at 80. Eleven counties report average, and only two, Livingston and Titus, above; each 110.

Blanco: Being replanted the third time, bids fair to make a good crop. *Hays:* Crop very young and late; all the early crop was destroyed by frost. *Milam:* Prospect of a good crop, though late. *Henderson:* Crop two weeks behind last year, when it was two weeks behind the year before. Now the weather is favorable, but I have never known a full crop made when so late. *Caldwell:* The decrease in condition compared with last year is owing to late frost, but the season being very favorable the crop is now doing finely and promises well. *Limestone:* Rarely a better prospect for a good crop. *Marion:* Small, but looks well. *Austin:* Far behind last year; plentiful rains, coupled with extreme warm weather, are bringing it forward, but also giving grass and weeds a vigorous start. *Dallas:* Too small yet to guess at a yield. *Coryell:* Twenty per cent. more planted this spring than ever before. The growth backward, but the stand and prospect good. *Burnet:* At least four weeks backward. *Atascosa:* Two plantings eaten up by the grasshoppers, and now the army-worm has set in on the third. *Galveston:* All *sea-island* cotton in this county this year. *Hunt:* Continued heavy rains from the 17th to the 28th of May have injured the prospect. *Williamson:* Very promising. *Bexar:* Promising well. *Rusk:* Too wet since May 18th to plant cotton-land; the plant yellow and very grassy.

Out of twenty-six returns from Arkansas all except six show an increase in acreage, and only two a decrease. Ten indicate an average condition, and three above. The counties having the lowest condition are, Newton 50, and Bradly 70. The average for the State is 92.

Hempstead: Much difficulty in securing good stands. *Woodruff:* Many fields replanted, or plowed up and planted with corn. Cut-worm worse than ever before known. *Jackson:* Good stands; season generally favorable; farmers all seem cheerful. *Clark:* Rather late, but stand good. *Crittenden:* Owing to the cold, wet spring, we failed to get stands; had to plant seed the second time. Planted over one month later than usual. *Jefferson:* The cold spring, late frosts, and heavy rains make the condition bad. *Independence:* Cotton-planting delayed about thirty days by cold, wet weather. *Pulaski:* Cotton about fifteen days late; more or less weedy and grassy; hands working well.

Only two counties in Tennessee report a decrease in acreage: Fayette 15 per cent. and Shelby 10. Humphreys, an increase of 100 per cent.; Henry, of 50, and Obion of 30. Sumner returns a condition of 120, which is the only county above average; the remaining twenty-six from which returns have been received, range in condition from 100 down to 75.

Fayette: The crops said by old settlers to be in a worse condition than ever before. Weather has been, up to this date, remarkably wet and cool. Much cotton has been replanted. *Dyer:* Much of the crop has been plowed up and replanted as late as the 15th and 20th of May, which makes it very uncertain in this latitude. *Madison:* Nearly all of the early cotton had to be planted over again, which makes it very late; bad stands. *Cross:* Many had to plant the second time, and continuous rains since leave it in bad condition. *Hardin:* Stand bad; in some instances the crop is being plowed up and planted in corn, or replanted with cotton. Cotton-seed scarce and of an inferior quality. *Gibson:* Indifferent stand and unfavorable condition, owing to continued rains, cool weather, insects, &c. *Giles:* Fifteen to twenty days backward, and generally very much in the grass. *Leon:* Damaged by the late cold weather. *Tarrant:* For weeks past too much rain, damaging cotton to a considerable extent. *Washington:* Excessive rains in May injured cotton.

KANSAS.—*Sumner:* Many small experiments in cotton. *Reno:* Cotton is sown and looks well.

CORN.

The statistical returns, completed June 1, do not include the area and condition of corn, for the reason that it is too early; but our correspondents have frequently referred in their foot-notes to conditions which affect the prospects of that crop. The following extracts will show that the planting of corn, in most sections of the country, has been much retarded by excessively wet and cold weather, and that the pests which usually thrive in such a season, the cut-worms, have commenced extensive operations, and threaten to greatly damage the crop:

MAINE.—*Cumberland:* Not coming up well.

NEW YORK.—*Tioga:* Just planting corn. *Erie:* Not half planted.

PENNSYLVANIA.—*Washington:* Very backward. Many now replanting because of cut-worms; in some fields the dry spell killed the sprouts before they came up. *Lancaster:* Very irregular start; the most of it had to be replanted. *Lawrence:* The dry weather is injuring the crop materially. *Armstrong:* Planted the second and third time.

MARYLAND.—*Caroline:* Spring not favorable for corn. *Talbot:* Backward. *Frederick:* Coming up badly, much to be replanted, with great complaints of worms and insects. *Cecil:* Very late planted. *Queen Anne:* Only three-fourths of a crop planted; very backward, and badly injured by cut-worm.

VIRGINIA.—*Spottsylvania:* Very backward; many farmers have at least one-half to plant yet, on account of wet weather. *Pulaski:* Planting very backward on account of wet weather. *Charlotte:* Farmers not done planting on account of much rain. Many have to plow and plant over on the river and creek bottoms on account of freshets. *Lunenburg:* In consequence of much rain the corn-crop is late in planting, and much has to be replanted. *Madison:* Coming up well, but being injured by the cut-worm. *Nelson:* For several weeks the land has been kept too wet for plowing or planting, and farmers are unusually late in planting corn. *Clarke:* Very backward, and

kept down by the cut-worms, which are more numerous than ever known before. *Henrico:* Planting has "drawn its slow length along" four weeks, and is not yet over. *Highland:* Continued rains kept corn from being planted; not all done yet. *Marion:* Planting two weeks later than usual; now being worked, and looking finely.

NORTH CAROLINA.—*Lenoir:* A rain-fall, the heaviest we have had for many years, May 21, seriously damaged the crops; washed up the corn, which will have to be replanted. *Hertford:* Crop looks well. *Sampson:* Prospect never poorer. *Rowan:* Considerably washed up by the freshets. *Anson:* Benefited by the wet spring. *Green:* Very heavy frost on the 25th of April; cut the corn all down, and killed a large portion. Some plowed up and planted again; others replanted; the crop 25 per cent. below average.

SOUTH CAROLINA.—*Darlington:* Killed by frost and ice April 26; much replanted. *Orangeburgh:* Backward. *Newberry:* The continuous wet weather and the washing rains have injured stands of corn in low lands.

GEORGIA.—*Douglas:* Looking well. *Liberty:* Badly in grass and weeds, from showers day and night. *Coweta:* Looking very well. *Troup:* Looking finely; a great deal more planted than the previous year.

FLORIDA.—*Gadsden:* The farmers of this county plant a sufficiency of corn and oats to insure an ample supply for their own use and a small surplus; importations of corn are for non-producers, both white and black, the number of which is, unfortunately, large. *Wakulla:* Better stands than last year. *Suwannee:* In fine condition. *Hamilton:* Prospect finer than for a number of years. *Levy:* Silking; prospect of a better crop than for several years.

ALABAMA.—*Clarke:* Very good; a rise in the rivers has done some damage on low lands, but replanting is going on. *Franklin:* The cut-worm has been far more destructive than usual, injuring materially the stands of corn. *Lauderdale:* Looks well, though late. *Crenshaw:* Looks well. *Montgomery:* More planted than last year, and promising well. *Macon:* Seriously injured by the rains. *Dallas:* Cultivation better than usual; decrease on last year's acreage of 15 per cent.; condition, average.

MISSISSIPPI.—*Hart:* Looks well. *Tishemingo:* Very favorable for corn. *Bolivar:* A great deal more planted than last year. *Jefferson:* Doing well, but small.

LOUISIANA.—*Claiborne:* Small but healthy. *Rapides:* The recent wet weather affecting corn seriously. *Tensas:* Prospect the best for many years.

TEXAS.—*Blanco:* Being replanted the third time; bids fair to make a good crop. *Milam:* Prospect for a good crop, though late. *Limestone:* The prospect for a good crop rarely better. *Marion:* Fifteen per cent. above average. *Dallas:* Too small yet to guess at a yield. *Burnet:* At this time, when corn ought to be blooming, we are giving it the first plowing. *Fayette:* Late frosts killed the corn; yet, owing to a very propitious season since, the crop has regained what was lost, and presents an average condition. *Bandera:* Now being planted the third time. *Hunt:* Prospects injured by continued heavy rains from the 17th to the 28th of May; killed by severe frost March 26; now waist-high. *Rusk:* Hill-corn looks well; Cooly corn in silk. *Lampasas:* Our farmers planted corn three times; have now a good stand, growing finely.

ARKANSAS.—*Hempstead:* Much difficulty in securing a good stand.

TENNESSEE.—*Sumner:* Some farmers have been forced to plant their corn the third time on account of the cut-worm. *Granger:* Looks tolerably well.

KENTUCKY.—*McLean:* Late corn-planting. *Hardin:* Low, in the weeds, bad color. *Russell:* Corn-planting unfinished.

OHIO.—*Mercer:* Late corn-planting. *Miami:* Mostly up and in good condition. *Gallia:* The worst corn prospect for many years. *Defiance:* Not much planted. *Wyandot:* About half the corn planted, and much requires replanting on account of bad seed. *Champaign:* Prospect poor, much requiring to be replanted. *Adams:* Late-planted, but growing finely.

MICHIGAN.—*Ingham:* Much of the first planting of corn a failure through bad seed. *Oakland:* Early-planted corn rotted.

INDIANA.—*Decatur:* Planting delayed three weeks. *Noble:* Planting late. *Wayne:* Planting delayed. *Huntingdon:* Not much corn planted; plowing but half finished. *Miami:* Only half the corn-ground planted. *Carroll:* Planting just completed. *Marion:* Planting not yet finished. *Ripley:* Planting not completed. *Spencer:* Only half the corn planted. *Cass:* Not half the corn planted. *Warren:* Not all planted; cut-worms taking the early plantings. *Morgan:* Planting not finished. *Jasper:* But half the corn planted. *Posey:* Cut-worms very destructive to young corn. *Wells:* Planting unfinished.

ILLINOIS.—*Kankakee:* One-fourth of the corn not yet planted. *Monroe:* Planting delayed by wet. *DeKalb:* Early plantings mostly rotted; seed not generally very good. *Sangamon:* Planting late. *Jersey:* Very little planted; prospects not flattering. *Macon:* Half the corn planted. *Carroll:* Seed-corn rotting badly. *Grundy:* Not one-twentieth of the usual acreage yet planted. *McLean:* Not all planted. *Ogle:* Planting late; much replanting. *Putnam:* Much replanting. *Scott:* A third

of the corn replanted. *Stephenson:* Much replanting. *Henry:* Planting late. *Lee:* Planting not finished. *Boone:* Early-planted corn rotted; planting very backward; not finished till May 30. *Hancock:* Planting late. *Marion:* Planting a month later than last year. *Piatt:* Still planting, June 5. *Whiteside:* Planting three weeks late; promises a poor stand. *Bond:* Planting delayed by rain; cut-worm doing some damage, but the high temperature, 90°, has killed many of them.

WISCONSIN.—*Walworth:* Planting late; not promising. *Clark:* Early corn cut down by frost May 30. *Green:* Planting delayed by wet weather.

MINNESOTA.—*McLeod:* Much corn has rotted. *Noble:* Planting late. *Freeborn:* Planting delayed by rain.

IOWA.—*Poweshiek:* Planting at least two weeks late; considerable not yet planted. *Tama:* Early-planted corn rotting. *Hardin:* Just coming up; much of it replanted. *Carroll:* Early-planted corn rotting; a third not planted yet. *Louisa:* Planting fifteen days late. *Johnson:* Much corn replanted on account of poor seed and bad weather. *Delaware:* Wet weather; bad for corn, which is not all planted. *Chickasaw:* Not yet planted. *Shelby:* Twenty per cent. of the farmers have not yet planted corn, on account of rain. *Mitchell:* Backward on account of weather. *Buena Vista:* But little corn yet planted. *Audubon:* Backward and yellow. *Iowa:* Weather bad for corn. *Harrison:* Planting delayed by rains. *Lee:* Not half the corn planted. *Winneshiek:* Planting very late; considerable seed rotted in the ground on account of cold rains.

MISSOURI.—*Clinton:* Planting late; seed rotted in the ground in many cases. *Platte:* But little planted, and that in bad condition on account of the wet. *Lincoln:* Half the corn-land not yet planted. *Polk:* Late planting, but finished. *Vernon:* Much corn washed up by floods May 25. *Moniteau:* Planted in good season and coming up well. *Shelby:* Backward. *Pulaski:* Attacked by chinch-bugs. *Nodaway:* Doing well. *Adair:* Planting unfinished. *Jasper:* Corn-season backward. *Maries:* Attacked by chinches. *Ralls:* Planting delayed by heavy rains; not half planted.

KANSAS.—*Neosho:* Looks well; mostly planted before the wet weather set in. *Labette:* Poor prospect. *Woodson:* Many acres of corn flooded by the Neosho. *Linn:* Planting late. *Marion:* Many acres of early corn plowed up and replanted on account of weeds. *Coffey:* Crops damaged seriously by rain. *Shawnee:* Planting delayed by wet. *Doniphan:* Doing well.

NEBRASKA.—*Johnson:* Will be put in late. *Gage:* Too wet to get in corn. *Cass:* But half planted. *Merrick:* Planting unfinished. *Washington:* Not all planted. *Cuming:* Will probably be a failure on account of heavy rain-fall.

OATS.

An increased acreage of oats, and a condition above average is reported in the majority of the States. The greatest enlargement of acreage is in Louisiana, 31 per cent. above the previous year. The greatest decrease is in Ohio, 27 per cent. The other States showing a decreased acreage are Rhode Island, 7 per cent.; New Jersey, 8 per cent.; Pennsylvania, 2 per cent.; Delaware, 8 per cent.; Maryland, 1 per cent.; Tennessee, 1 per cent.; Michigan, 5 per cent.; Indiana, 16 per cent.; Illinois, 13 per cent.; New York and Massachusetts are full average while the remainder of the States range from 1 to 31 per cent. above average. The condition of the crop is average or above in all the States except Vermont, Massachusetts, Rhode Island, New York, New Jersey, Pennsylvania, Texas, Tennessee, Ohio, Michigan, Indiana, Illinois, and California. The maximum is found in Virginia, 113; the minimum in California, 83.

MASSACHUSETTS.—*Middlesex:* About average. *Norfolk:* Have been more extensively sown and look well. In this county great quantities are *cut green* for fodder.

NEW YORK.—*Genesee:* Very late in starting; the ground in bad condition, being hard and dry.

NEW JERSEY.—*Hunterdon:* Many have been unable to put in more than a small crop of oats in consequence of the late and wet spring.

PENNSYLVANIA.—*Clinton:* Very backward, owing to the wet and late spring. *Berks:* Look remarkably well. *Bucks:* From two to three weeks late on account of wet weather. *Lawrence:* The dry weather is materially injuring the crop. *Cambria:* Very backward on account of the cold, wet spring. *Armstrong:* At a stand for want of rain.

MARYLAND.—*Caroline:* German yellow oats, from the Department, very promising.

VIRGINIA.—*Botetourt:* Very promising. *Spottsylvania:* Crop not large, but very promising. *Lunenburg:* The weather in May favorable to oats. *Warren:* Were looking remarkably well May 1, but since the dry weather have been attacked by a small fly which has destroyed from 10 to 15 per cent. *Henrico:* Have never seen such crops of oats, both winter and spring, as are now growing. *Nansemond:* Drought in April cut short the oat crop. *New Kent:* Spring oats in better condition than I have ever seen them. *Prince George:* Very good. *Washington:* Good, *Chesterfield:* Never looked better.

NORTH CAROLINA.—*Hertford:* Bid fair for a good crop. *Cumberland:* Crop promising. *Anson:* Benefited by the wet spring. *Greene:* Injured by heavy rains in May. *Polk:* Looking better than last year.

SOUTH CAROLINA.—*York:* As the cultivation of corn on the uplands diminishes, reliance upon the oat-crop is gradually increased. It is rarely a full one here; rust, blight, and the dry weather in May and June generally cut it off.

GEORGIA.—*Muscogee:* Fall oats mostly killed by freezes during the winter. Considerable quantities sowed this spring, but do not look well. *Calhoun:* Winter oat crop very good; now ready for harvesting. *Madison:* Fall oats winter-killed. Spring oats better than usual. *Murray:* The season very favorable for oats.

FLORIDA.—*Jackson:* Crop has done well. *Levy:* The crop is being gathered; very good.

ALABAMA.—*Lauderdale:* The winter held on so long that our people thought it too late to make good oats; hence the acreage is much less than usual. *Montgomery:* Acreage more extensive than usual; healthy and promising. *Conecuh:* Better than last year, owing to late rains.

MISSISSIPPI.—*Rankin:* Now harvesting; none sown but red.

TEXAS.—*Palo Pinto:* Almost totally destroyed by grasshoppers. *Coryell:* Prospect good, but the harvest will be at least one month later than usual. We have a variety called red oats, which last year made 60 to 70 bushels per acre. *Burnet:* Injured by frosts and grasshoppers. *Williamson:* Harvesting; promise better than average. *Gilmer:* Injured by drought.

TENNESSEE.—*Loudon:* Never looked better. *Gibson:* Season has been favorable for oats. *Grainger:* Good.

WEST VIRGINIA.—*Mercer:* Shortened by cold, backward spring. *Nicholas:* Oats very good. *Monroe:* Oats look well. *Pocahontas:* Fair condition.

KENTUCKY.—*Hardin:* Oats low, but of good color. *Lincoln:* Promising. *Greaves:* Good.

OHIO.—*Athens:* Oats promising. *Warren:* Promising. *Sandusky:* Oats promise a poor crop.

MICHIGAN.—*Clinton:* Oats sown very late.

INDIANA.—*Noble:* Acreage of oats cut down by wet weather. *Dearborn:* Season too wet to sow oats to any extent.

ILLINOIS.—*Williamson:* Look well. *Macon:* Yellow from rain and cold. *Ogle:* Late planted, and somewhat under average. *Henry:* Fine prospect and increased acreage.

MISSOURI.—*Polk:* Oats look poorly, probably on account of backward season, but may come out yet. *Crawford:* Look finely. *Caldwell:* Look very well. *Franklin:* Chinch-bug in oats. *Pulaski:* Looking well. *Nodaway:* Fine. *Adair:* Very good. *Maries:* Chinch-bugs in oats.

MINNESOTA.—*Faribault:* Rain has prevented the sowing of many oat-fields on the flat prairies.

RYE.

The acreage of winter-rye ranges from 83 per cent. of last year's acreage in Rhode Island, to 124 per cent. in Kansas; twenty-four States report a decreased and ten an increased acreage. The condition is above average in New England, Pennsylvania, Maryland, Florida, Alabama, Arkansas, Minnesota, Missouri, Kansas, Nebraska, and California; Mississippi and Ohio are full average; the remaining States are below. The maximum, 110, is found in California; the minimum, 83, is in Illinois. Oregon makes no report. Spring-rye is reported in Pennsylvania, Georgia, Texas, Kentucky, Ohio, Michigan, Indiana, Missouri, Kansas, and California. The acreage compared with last year ranges from 81 in Kentucky to 108 in California; the condition, from 79 in Indiana to 108 in Kansas.

MASSACHUSETTS.—*Middlesex:* Winter-rye looking finely.

CONNECTICUT.—*Hartford:* Came out good in spring, having been covered with snow all winter.

NEW YORK.—*Schoharie:* Winter-rye good.
PENNSYLVANIA.—*Montgomery:* Very promising. *Berks:* Looks remarkably well. *Northumberland:* Looks unusually fine.
MARYLAND.—*Howard:* Promises at least an average crop.
VIRGINIA.—*Montgomery:* Badly winter-killed, but the crop remaining improves beyond expectation. *Henrico:* Very fine; probably the heaviest crop ever grown in the county. *Washington:* Badly winter-killed. *Highland:* Greatly injured by freezing.
NORTH CAROLINA.—*Cherokee:* Froze last winter worse than heretofore. *Ashe:* Badly injured by freezing. *Greene:* Injured by heavy rains in May.
GEORGIA.—*Marion:* Winter-rye received from the Department not worth anything; lies on the ground all winter and spring, when native rye is from 4 to 5 feet high. *Murray:* Badly winter-killed; quality will be good.
LOUISIANA.—*Bossier:* The rye sent me by the Department last fall is the finest I have ever seen.
TEXAS.—*Burnet:* Injured by frosts and grasshoppers. *Medina:* Winter-rye entirely destroyed by grasshoppers; not a bushel will be raised in the county. *Williamson:* Promises to be better than average.
TENNESSEE.—*Jefferson:* Thin and short stems; injured by freezing and wet weather.
WEST VIRGINIA.—*Mercer:* Winter-rye badly frozen. *Nicholas:* Rye about average; looks well. *Pocahontas:* Rye frozen out.
KENTUCKY.—*Lincoln:* Rye promising. *Greaves:* Good.
IOWA.—*Clinton:* Rye killed. *Muscatine:* Badly winter-killed. *Ringgold:* Rye badly winter-killed.

BARLEY.

Winter-barley is grown in Pennsylvania, Georgia, Texas, Kentucky, Ohio, Michigan, Indiana, Missouri, Kansas, and California; its acreage compared with last year's varies from 80 per cent. in Indiana to 110 per cent. in Texas; its condition from 65 per cent. in Kentucky to 108 per cent. in Kansas. Spring barley is reported in the New England, Middle, and Northwestern States, none growing south of the Ohio River. The maximum acreage, 128, is in Oregon; the minimum, 83, is in Indiana. The maximum of condition, 114, is in Missouri; the minimum, 85, is in California.

MASSACHUSETTS.—*Middlesex:* About average.
NEW YORK.—*Genesee:* Very late in starting; ground in bad condition, hard and dry.
KENTUCKY.—*Fayette:* Barley almost a failure.

GRASS AND PASTURES.

Throughout the New England States the grass in both pastures and fields, though late, appears to be "well set," and affords a favorable prospect for both grazing and hay. In Vermont the average condition of both clover and pastures is 99; of pastures in Massachusetts, 100. With these exceptions the condition of both was above annual average about the 1st of June. There is an increase in the acreage of clover, in all except Rhode Island, in which it is the same as last year. In New Jersey nearly all clover sown a year ago is reported as killed out by the drought last summer; that sown this spring is starting well. The report for Montgomery County, Pennsylvania—"grass well set, thick and thriving, though late for the season"—is a specimen for that State and Maryland, though in the latter the condition is somewhat reduced from the effects of drought last summer. In Georgia, Pike County returns an increase of acreage in clover of 400 per cent., and in Mississippi, Wilkinson returns an increase of 700 per cent. All the returns indicate an increase of area over last year of something over 2 per cent., and a promising, though backward condition.

MAINE.—*York:* Grass is well set. *Androscoggin:* Clover good; none last year. *Sagadahoc:* Grass is doing very well.

NEW HAMPSHIRE.—*Cheshire:* Everything very late except grass; pastures look very fine.

MASSACHUSETTS.—*Middlesex:* Grass winter-killed in places; clover badly, but hay exceedingly promising. *Plymouth:* Grass thick-set, but suffering for want of rain.

NEW YORK.—*Columbia:* Clover very poor; old pastures good. *Wyoming:* Clover coming on finely. *Madison:* Grass suffering from dry weather. *Lewis:* Grass looks finely. *Erie:* Pastures fed too close through May for their good.

NEW JERSEY.—*Sussex:* The clover sown last year will not make three-fourths of a crop, so much was lost from various causes; that sown this spring is doing well. *Monmouth:* Owing to the dry weather last summer we have but little clover. *Camden:* Will be very little clover-hay, owing to the poor stand last spring; the crop of timothy will be much better; pastures very short for the season. *Burlington:* Many fields have no clover; all killed last summer; the spring very favorable for the growth of young clover just starting in the wheat-fields; timothy better than clover, but does not promise an average crop. *Warren:* Clover is short; timothy promises a full crop.

PENNSYLVANIA.—*Clinton:* Very promising. *Union:* The cold, wet spring kept the meadow grass back, but it is now warm, and we expect a good hay crop. *Northumberland:* Clover and timothy look unusually fine. *Lycoming:* Clover and pastures looking well. *Greene:* Spring favorable on grass.

MARYLAND.—*Howard:* Frequent rains have given clover and grass a fine appearance. *Baltimore:* Pastures very abundant; grasses for hay in fine condition. *Cecil:* Very fine growth of clover and grass, but generally thin on the ground, owing to drought last summer. *Queen Anne:* Clover very backward and thin on land; pastures backward.

VIRGINIA.—*Botetourt:* Grass very promising. *Spottsylvania:* The crop of clover the best for many years. *Fluvanna:* The stand of clover is bad on account of last year's drought. *Hanover:* The cultivation of pasture and grass-bearing lands is a necessity in the eastern part of the State. We shall never recuperate the endless amount of worn-out lands until we understand the business of stock-raising. Orchard grass, timothy, and clover, are all susceptible of high cultivation in almost any part of the State. *Lunenburg:* Weather in May favorable for clover. *Montgomery:* The hay crop promises an abundant yield, and pastures are fine and rich. Orchard grass is becoming very popular. *Culpeper:* The dry weather of 1872 destroyed the growing clover, hence the small acreage of 1873. *Henrico:* Have never seen such crops of clover as are now growing. *Nansemond:* Drought in April cut short the clover crop. *Prince George:* Clover and hay crops very good. *Washington:* One-half the clover pulled out of the ground by freezes; looks healthy now. Pasturage very late, but growing well now. *Chesterfield:* Clover yielding finely.

NORTH CAROLINA.—*Martin:* Our principal pastures are on the low grounds of the Roanoke River, which has overflowed its banks this spring, and very materially injured them.

SOUTH CAROLINA.—*Greenville:* Red clover-seed sown last October came up and looked well, but it has disappeared. *York:* Spring pasturages are in fine condition.

GEORGIA.—*Troup:* Some clover lots sown the past spring promise well. The Italian rye grass sent by the Department is doing finely. *Jackson:* Clover will not do well unless on rich land and limed.

LOUISIANA.—*Franklin:* Our spring pasturage is of the native grasses, and is finer than for some years past.

TEXAS.—*Medina:* Pasturage suffered from grasshoppers.

ARKANSAS.—*Arkansas:* Pastures on the prairie excellent.

TENNESSEE.—*Loudon:* Our clover has been almost a failure in sowing for the last two years. *Bedford:* The freeze in the winter, and the army worm in the spring, destroyed nearly all the clover crop. *Gibson:* The season has been favorable to grass and clover. *Grainger:* Meadows rank with chess, here called "cheat." The cold snap, March 3d, injured the clover and meadows.

WEST VIRGINIA.—*Mercer:* Clover and spring pasture short, in consequence of cold, backward spring. *Pleasant:* Clover sowed last winter purer than previous crops. *Nicholas:* Clover fine. *Pendleton:* Fine weather is bringing out grass crops. *Putnam:* Clover thinned out by severe winter. *Harrison:* Season favorable to meadows, pasture backward, but improved by late rains, and better than for two or three years. *Monroe:* Clover and pasture fine.

KENTUCKY.—*Shelby:* Clover badly frozen out. *Taylor:* Clover damaged by freezing 50 per cent. *Fayette:* Clover promising. *Lincoln:* Clover badly winter-killed. *Laurie:* Clover nearly frozen out. *Edmonson:* Clover badly winter-killed.

OHIO.—*Warren:* Grass crops promising.

MICHIGAN.—*Washtenaw:* Hay prospects poor.

INDIANA.—*Perry:* "A strange weed or grass has made its appearance in our meadows, old and young, seriously threatening to destroy them. Hoeing has not proved successful. It resembles sour-sorrel, the German *sauer-grass.* It sprouts from the roots which are very long and tough. It is crowned with a brownish top of seeds or bloom

Its first appearance was remarked some two years ago. In spots it has entirely killed out the grass." *Noble:* Pastures good. *Huntington:* Pastures very short. *Cass:* Clover sown this spring has taken finely.

ILLINOIS.—*Pope:* Clover badly frozen out. *Winnebago:* Pasture short; half the clover winter-killed. *Williamson:* Army-worm taking the meadows. *Randolph:* Badly injured by drought last year. *Perry:* Army-worms in meadows. *Fulton:* Two-year old clover badly winter-killed; will bring but a half crop. *Montgomery:* Pastures and meadows fine. *Boone:* Clover badly winter-killed.

WISCONSIN.—*Jefferson:* Clover badly winter-killed. *Walworth:* Grass-crops backward, but healthy and green. *Saint Croix:* Clover badly winter-killed. *Dunn:* Grass prospects improving. *Green:* Clover largely winter-killed. *Monroe:* Clover badly winter-killed, but what was left is fine. *Vernon:* Two-year old clover winter-killed; younger doing finely.

MINNESOTA.—*Dodge:* Clover badly frozen out. *Steele:* May favorable for grass. *Winona:* Pasturage late. *Goodhue:* Red clover extensively winter-killed; other grasses much injured.

IOWA.—*Muscatine:* Pasture injured by grub-worms last year. *Louisa:* Clover badly frozen out. *Floyd:* Pasture good but unusually late. *Winneshiek:* Old clover-meadows and pastures badly frozen out.

MISSOURI.—*Holt:* No tame grasses raised. *Caldwell:* Old clover-roots badly killed. *Greene:* Late fine weather greatly improved grass-crops. *Shelby:* Grass-crops fine. *Pulaski:* Increased attention to clovering. *Adair:* Clover and pastures look well. *Ralls:* Grasses look well.

CALIFORNIA. *Kern:* Much attention to Alfalfa; largely grown on irrigated land. *Butte:* Alfalfa the only clover grown; dry spring has cut down pasture. *Stanislaus:* Hay will yield from one-fourth to two and a half tons per acre.

COLORADO.—*Conejos:* Very little grass for stock.

UTAH.—*Salt Lake:* Grass crops unusually promising. *San Pete:* Pasturage very good. *Wahsatch:* Rains very genial to spring pasture.

IDAHO.—*Nez Percé:* Late rains have made fine pastures.

FRUIT.

Almost every variety of fruit appears to have been more or less injured by the unusual severity of the winter, and the late spring frosts The damage to the peach-crop from these causes has been universal, and in most sections very serious, not only destroying the crop for this season, but the tree itself. Specific statements will be found in the extracts below. In the New England and Middle States the average amount of apple-bloom falls about 24 per cent. below medium. The average per cent. for the remaining States is considerably higher, though less than medium. The only States in which the average amount is above medium or 100 are: Virginia, 102; Louisiana, 101; Michigan, 106; Wisconsin, 104; Iowa, 110; Kansas, 122; Nebraska, 128; and Oregon, 163. In Delaware the return from Sussex places the amount of peach-bloom at 200; New Castle, 25; and Kent, 100. The average of the counties reporting from Alabama and Mississippi is 100; from Tennessee, 101. But in all the other States it is below 100, and in the principal peach-growing States much below. In New Jersey, 70, and average condition, 81.

MAINE.—*York:* The apple-blossom is much better than usual for the odd year. *Somerset:* Apple-trees just in bloom. *Androscoggin:* Apples, pears, and peaches not yet in blossom to any amount. *Piscataquis:* Apples not in bloom yet.

NEW HAMPSHIRE.—*Hillsborough:* The fruit-trees, not yet in bloom, look well. *Cheshire:* Apple-trees have but commenced blooming. The extremely cold winter paralyzed the fruit-trees, destroying a great number of them, and also of grape-vines not protected.

MASSACHUSETTS.—*Middlesex:* Very full blossom of pears. *Berkshire:* Pears in full bloom; apples just showing blossom. *Norfolk:* Apples low; peaches lower; many of the peach-trees are winter-killed; pears look well.

CONNECTICUT.—*Hartford:* Peach-trees much injured by the cold winter; fruit-trees blossomed two weeks later than usual.

NEW YORK.—*Greene:* The winter was so severe that our peach-buds are all killed, and some of the trees. *Rensselaer:* The first apple-blossoms May 24; fifteen days later than usual. *Cattaraugus:* Apple-trees just in bloom. *Steuben:* Fine show of fruit of all kinds.

Washington: Apple-trees just in full bloom. *Wyoming:* Fruit-trees late, but full of blossoms. *Jefferson:* The prospect for fruit very good. *Niagara:* Peaches an entire failure. *Erie:* Plum-trees in bloom the 25th; cherry-trees the 27th; apple-trees half out on the 30th.

PENNSYLVANIA.—*Luzerne:* Peach-trees nearly all killed by the winter; also grapes; pears good as usual. *Union:* The peach-trees are all dead, the winter being too cold. *Clearfield:* Fruit-trees just in blossom. *Adams:* The extreme cold of last winter proved very destructive to buds, in many instances killing even the trees. There will probably not be over 100 bushels of peaches in the county. *Cumberland:* Peaches have all been frozen. *Berks:* Fruit of all kinds looks rather discouraging. Peach-trees and grape-vines badly frozen—worse than I ever knew them. *Northumberland:* The uncommonly severe frosts of last winter killed most of our grape-vines and quince-trees, and so greatly injured our cherry, peach, and plum trees, that they will bear little, if any, fruit this year. My Catawba and Isabella grape-vines froze down to the ground, and even my Clinton vines were considerably injured. Apples and pears promise a fair crop. *Lancaster:* Fruit considerably damaged by the severe winter. *Greene:* All the peaches on low ground winter-killed.

NEW JERSEY.—*Sussex:* Apples will not make more than half a crop, judging from the quantity of blossoms, but the condition is good. No peach-blossoms; suffered from the severe winter. *Monmouth:* Peaches have been generally killed. *Camden:* Peach-bloom killed last winter; also the twigs and young limbs of last year's growth. *Burlington:* No fruit worth mentioning in my peach orchard and those in the vicinity. Pears very promising. Many apple-trees had no bloom. *Mercer:* The bloom has just fallen; fruit promises well. *Hudson:* Orchards exhausted by the large yield last year, but where manure was profusely used a fair crop is promised. Pears blossomed well, but late frosts caused the fruit to drop off.

DELAWARE.—*Sussex:* Area in strawberries double that of last year; flattering prospect for a large crop.

MARYLAND.—*Howard:* No peaches on low lands. *Caroline:* A large crop of strawberries. *Baltimore:* Peaches are winter-killed; other fruit promising. *Queen Anne:* Apples, peaches, and pears much injured by late frosts.

VIRGINIA.—*Powhatan:* Crop promises to be enormous. *Northumberland:* On the night of April 25 ice made an eighth of an inch thick, and did considerable damage to fruit. *Spottsylvania:* Large apple-crop; largest peach-crop for many years. *Floyd:* The peach-crop, pears, and early cherries, have been greatly injured by late frosts. *Greenville:* Promise of abundant pears and peaches; apples are dropping off sadly. *King William:* On the 4th of April we had a very severe freeze, which killed the apples, then in bloom; but the peaches were too far advanced to be much hurt. *Warren:* Peaches nearly all destroyed by frost, except those on high land with northern exposure. *Prince George:* The severe frost April 26 seriously injured the fruit; remote from the water-courses there will be scarcely any. *Mecklenburg:* Fruit crop very promising. *Alexandria:* Peach-buds generally injured by the severity of the winter. *Buckingham:* Fruit-crop badly injured by frost April 20. *Chesterfield:* A large portion of the fruit has dropped off the trees, owing to the severe freeze on the 26th of April. *Lancaster:* All kinds give promise of an abundant crop.

NORTH CAROLINA.—*Gates:* The apple and pear crop almost an entire failure. *Chowan:* Scarcely any apples or pears. *Cherokee:* Apple and peach crop nearly destroyed by the frost late in April. *Davie:* The heavy frost April 26 killed fruit. *Haywood:* Not as full bloom of fruit-trees as common; a frost late in April killed at least three-fourths of the crop. *Cumberland:* Fruit of all kinds killed by freeze April 26. *Franklin:* Damaged by hail-storms. *Moore:* Fruit nearly all killed by late frosts. *Rowan:* Fruit-crop almost entirely destroyed by frost in April. *Iredell:* Fruit of all kinds killed by frosts. *Ashe:* Peaches killed in the bud. *Anson:* A killing frost about the last of April damaged the fruit to a great extent. *Union:* Dry weather, and heavy frost the last of April, killed nearly all the fruit. *Polk:* The fruit-crop will be almost a failure on account of heavy frosts. *Burke:* Late frosts have killed, in many places, nearly all the fruit-crop. *Montgomery:* Nearly all fruits killed by the frost of April 26. *Stanly:* The hard frost in April well-nigh annihilated the crop of fruit.

SOUTH CAROLINA.—*Darlington:* Bunch-grapes entirely destroyed by severe frost and ice, April 26. Peaches severely injured; also pears and apples. *Fairfield:* Fruit all killed by frost April 26. *Greenville:* All the young fruits appear to be dead; the trees wear a burnt aspect. *York:* Fruit of all kinds a complete failure, being killed by the frosts from the 15th to the 25th of April. *Lexington:* The entire crop of apples, pears, peaches, and grapes nearly destroyed by a heavy frost April 25. *Marion:* Fruit destroyed by frost April 26.

GEORGIA.—*Madison:* A failure owing to the killing frost on the 26th of April. *Irwinton:* Peaches and apples destroyed in a great degree by cold, high winds. *Troup:* An abundance of peaches and other small fruits. *Jackson:* Apples and peaches killed by frosts.

ALABAMA.—*Winston:* A frost, April 13, injured fruit. *Saint Clair:* In some neigh-

borhoods all the fruit was killed by a severe frost on the 25th of April, while in others it was not injured. *Blount:* Peaches killed in many places by frost on the 25th of April. *Montgomery:* Fruit prospect very flattering. Strawberries unusually abundant since the middle of April; remarkably large, especially the Boyden No. 3; the fruit a month later than in 1871, on account of the intensely cold winter and backward spring. Raspberries fine, especially our native black-caps. Our native red and yellow plums now ripe and abundant. Apples abundant; the early varieties now ripening; crop more promising than for several years. Peach-crop equal to that of 1871, though later. Pears healthy and promising. Blackberries very healthy: the Kittatinnies and Rochells full of large, fine fruit. Grapes doing well: the six varieties sent me by the Department all living and doing well. *Calhoun:* Fruit nearly all killed by frost. *Autauga:* Apples nearly all dropped off. *Coffee:* Late frosts killed most of the fruit.

MISSISSIPPI.—*Tishomingo:* Apples and peaches fallen off.

LOUISIANA.—*Morehouse:* A severe freeze on the 28th of March reduced our peach-crop over one-half. The grapes promise fair; vines fuller with fruit than ever before. The Catawba and the Isabella bloomed on the 26th of April—ten days earlier than usual. *Terrebonne:* Some varieties of apples and pears do well here. They are now attracting much attention, and many young trees have been set out this year. The orange, fig, plum, peach, grape, banana, and quince are produced abundantly. The pine-apple, with a very little protection for a few days in winter, does well with us. *Washington:* Fruit doing well. *Franklin:* The most of the peach-blooms, more plentiful than for several seasons, were killed by the freeze on the 25th March; what remain look very thrifty. *Claiborne:* Fruit of all kinds badly injured by frosts. *Caddo:* Fruit, which bloomed finely, was injured by late frosts.

TEXAS.—*Bosque:* All killed. *Hays:* Peach-crop entirely destroyed by frost. *Marion:* Fruits and berries 25 per cent. above average. *Titus:* The various varieties of fruit bloomed finely, but about the time of the dropping of the blossom the freeze came, leaving not more than 50 per cent. of late apples, 25 per cent. of peaches, and 10 per cent. of pears. All varieties of small fruits that were in bloom shared the same fate. *San Saba:* The severe frost on the 26th of March destroyed all the fruit. *Coryell:* Will not be a bushel of peaches raised in the county. *Fayette:* Late frosts killed a portion of the peach-crop; what remain are larger than common. *Medina:* Peach-crop suffered from grasshoppers. *Galveston:* Fruit generally killed by frost. *Bexar:* Severe frost March 26 damaged fruit. *Fannin:* Fruit injured in some localities by recent hail-storms. *Gilmer:* Peach-crop nearly lost by frost; apples and pears much damaged. *Leon:* Fruit-crop a total faliure owing to the late cold weather.

ARKANSAS.—*Clark:* Peaches injured by frost; apples full and promising; pears very full. About 30 per cent. of trees died from some disease. *Sebastian:* The unusually cold winter killed all the peaches and many of the peach-trees; maybe half a crop of apples and pears. *Benton:* A heavy snow, April 7, destroyed nearly the entire crop of fruit; peaches all killed in the winter. *Jefferson:* Late frosts have damaged all fruit beyond recovery. *Washington:* Apple and peach crops nearly a failure, owing to the extreme cold winter and late frosts.

TENNESSEE.—*Anderson:* Killed by late frost. *Decatur:* The frost injured the apple and peach crop after the blossoms had mostly dropped off. *Madison:* The caterpillars have destroyed the apples, and are now doing great harm to the timber by taking off all the leaves. *Rhea:* Heavy frost on the 18th of April killed nearly all the fruit. *Smith:* Of apples, peaches, and pears there is not half a crop left. The bloom was fine and the prospect excellent till the 26th of April, when a severe frost destroyed it. *Sevier:* A frost with ice on the 26th of April killed about all the fruit in this county. *Bedford:* Apples, peaches, and pears killed by the frost in April. *Jefferson:* Apples, peaches, and pears destroyed in great measure by cold snap in April. *Montgomery:* Frost killed the fruit. *Meigs:* A late frost killed all our fruit except in a few orchards in favorable locations. *Marion:* Fruit all killed by frost. *Humphreys:* Fruit-crop almost entirely killed by frosts. *Gibson:* The fruit prospect was flattering, but unfortunately, through the ravages of the caterpillar the trees have been denuded. *Giles:* Fruit-crop will be almost a failure; killed by frost, April 26. *Grainger:* Few peaches on high land; all killed on low land. Scarcely any apples. *Morgan:* A frost, April 21, destroyed most of the fruit. *Henry:* Frost in May killed a large portion of apples and peaches, and damaged many small fruits. *Hancock:* Apple-bloom very light; peach-bloom abundant, but nearly all killed by frosts.

WEST VIRGINIA.—Apples, peaches, and pears damaged by frost; peaches largely killed in the bud. *Randolph:* Apples falling from effects of frost. *Nicholas:* Fruit-bloom copious, but the crop will be small. *Kanawha:* Unusually copious apple-bloom, but the fruit is cut short by frost. Peach-bloom mostly confined to the Kanawha bottoms. *Braxton:* Peach-bloom only on the higher table-lands; many trees killed: the same true, to some extent, of apples. Borers killed some. *Pendleton:* Fruit considerably destroyed by cold weather; peaches ceasing to be a successful crop. *Mineral:* Apple-crop a failure and peaches all winter-killed except on high lands. *Tyler:* Fruit

generally and severely injured by frost. *Monroe:* Apples slightly injured by frost; peaches partly winter-killed.

KENTUCKY.—*McLean:* Fruit greatly damaged by frost. *Taylor:* Frost spared the fruit of only a few sheltered localities. *Laurel:* Apples, peaches, and pears largely destroyed after blooming. *Spencer:* Fruit prospects injured by frost. *Livingston:* Pear-blossoms dropped without maturing; peach-bloom copious, but largely killed in the low grounds by March frosts. *Grayson:* All the peaches and pears, and three-fourths of the apples, frost-killed. *Larue:* Peaches killed, except in the hill country, by April frost. *Nicholas:* Peaches mostly fallen from the trees; leaves crisped; crops will be light. *Breckinridge:* Peaches killed in all the valleys and low grounds by the frosts of April 26. *Russell:* Fruit almost an entire failure; found four apples on seventy-five trees; scarcely any peaches or pears.

OHIO.—*Logan:* Peach-bloom nearly all killed. *Vinton:* Fruit prospects small; probably apples enough for home-consumption. *Franklin:* Apples attacked by a black or dark-brown worm 1¾ inches long. *Geauga:* Peach-trees largely winter-killed; scarce a bushel of the fruit will be raised; only the hardier varieties of apples escaped. *Defiance:* Grape-vines generally winter-killed, and had again sprouted from the roots; the sprouts were killed by the heavy frosts of May 31. *Hardin:* Copious pear-bloom, but little or no fruitage. *Jefferson:* Peaches nearly a failure; not one-tenth of an average. *Warren:* Few apples; no peaches; a few pears and cherries. *Sandusky:* Peach-trees all winter-killed; pears winter-killed, with many trees.

MICHIGAN.—Apples and pears in full bloom; peach-trees nearly all dead; fruit of all sorts much injured. *Lapeer:* Peaches nearly all winter-killed; few blossoms. *Monroe:* Peach-trees nearly all killed; have not seen a peach-blossom. *Newaygo:* Fruit-trees generally injured by winter; peach-trees nearly all killed; some other fruits promise a fair crop. *Calhoun:* Peach-trees nearly all killed. *Cass:* Peach-trees generally killed. *Barry:* Peach-trees mostly killed. *Mecosta:* Peach-trees frozen down to the ground; pear-trees greatly injured. *Mason:* Very little peach-bloom. *Clinton:* Apples barely out of blossom.

INDIANA.—*Switzerland:* Peaches on bottom-lands killed by late frosts. *Ripley:* Apples and pears not more than a fourth of a crop; few peaches; many peach-trees winter-killed. *Hendricks:* Quite a number of trees in young orchards winter-killed; in an orchard of 500 white pippins, one-third will die. *Kosciusko:* Hard winter killed nearly all the peach and many of the cherry trees. *Morgan:* Peach-trees killed or badly injured. *Union:* Blight cut down the pear crop one-fourth; apple-trees injured by caterpillars, and forest-trees by measuring-worms. *Brown:* Peach-trees all killed except on the highest table-lands. *Newton:* Grape-vines, and peach and pear-trees, damaged by the very cold winter.

ILLINOIS.—*Champaign:* Nearly all the peach-trees and many apple-trees killed. *Clinton:* Peach-trees all killed; apricots and cherries killed, as also half the pears; many apple-trees also killed. *Marion:* Many fruit-trees and most of the fruit-killed; gooseberries and currants will yield a small crop. *Williamson:* Early apples frost killed in March and April. *Macon:* All the old peach-trees killed and 20 per cent. of the pears; grapes injured; Catawbas stood the winter the best of all the varieties. *Edwards:* Tent-caterpillars destroying apple-trees and forest-trees; peach-trees largely winter-killed. *Randolph:* Eighty per cent. of peach-trees winter-killed. *Wayne:* Poorest show for fruit ever known; ruined by cold and caterpillars. *Edgar:* Peach-trees winter-killed; many apple and pear trees injured; nearly all grape-vines, except Concords and Clintons, were killed. *Moultrie:* Peach-trees killed. *Putnam:* Peach-trees all winter-killed. *Henry:* Apple prospect poor. *Fulton:* Apple-trees badly injured; one-sixth will die; peach-trees all dead; pears nearly all killed; Flemish Beauty stood the winter best. *Macon:* Peaches all winter-killed. *McHenry:* Grapes and early strawberries slightly injured by frost. *Piatt:* Old peach and pear trees mostly killed. *Montgomery:* Peach-trees mostly killed.

WISCONSIN.—*Richland:* Apple-trees largely winter-killed. *Clark:* Frost of May 30 destroyed all early varieties of fruit with most of the apple and pear bloom. *Douglas:* Many fruit-trees set out last year have been destroyed by mice. *Saint Croix:* Apples blooming; some early buds and leaves killed by frost, May 11. *Dunn:* Frosts injured fruit. *Vernon:* Apple-bloom abundant, but deceptive; orchards of Western Wisconsin greatly damaged last winter.

MINNESOTA.—*Dodge:* Many varieties of apples winter-killed. *Steele:* Fruit somewhat affected by the severity of the winter; transplanted trees never looked better. *McDonald:* Peaches a failure; no bloom. *Hennepin:* Copious early bloom not followed by fruitage; trees seemingly injured. *Goodhue:* Apples-trees greatly injured.

IOWA.—*Tama:* One-fourth of pear-trees injured by winter. *Decatur:* Orchards mostly young; bloom very great; thousands of trees just coming into bearing. *Louisa:* Fruit-bloom abundant, but the fruitage probably ruined by cold rains and northeast winds. *Marion:* Peach-trees mostly winter-killed. *Grundy:* Nearly all the pear-trees killed with blight. *Des Moines:* Apple-bloom abundant, but the trees were so badly injured that many will die, and the fruitage small. *Harrison:* Peach-trees liable to winter-

kill; many thousands of young apple-trees planted this spring; grape prospect good. *Winneshiek:* Nearly all the pear-trees, many apple-trees and three-fourths of the grape-vines winter-killed.

MISSOURI.—*Crawford:* Peaches all killed by freezing, with many of the trees; apples not hurt. *Platte:* Peach-crop will be a complete failure; most of the trees winter-killed. *Holt:* Apple-bloom very copious; peaches winter-killed; pears look well, but this fruit is unreliable through blight. *Ozark:* Peach-trees mostly winter-killed. *Saint Genevieve:* All trees that bore peaches last year have been winter-killed. *Cass:* No peach-bloom. *Vernon:* Hail, on the night of May 26, beat the fruit from the trees to a great extent. *Maniteau:* Old peach-trees mostly winter-killed; young trees seriously injured. *De Kalb:* Peaches a failure. *Shelly:* Peaches all killed. *Pulaski:* Many old peach-orchards killed by severe weather; grape-vines starting vigorously. *Daviess:* Peach-buds all winter-killed, and many peach-trees badly injured. *Jasper:* Early apple-bloom killed; no peach-crop; trees badly injured by winter. *Taney:* Peach-crop winter-killed. *Newton:* Peaches all killed with many of the trees. *Jackson:* Apple-bloom very copious, but within a few days the blight has reduced the yield one-half.

KANSAS.—*Montgomery:* Fruit largely winter-killed. *Washington:* Peaches promise well in all trees three years old and upward; small fruits, good promise. *Franklin:* Peach-bloom all winter-killed. *Riley:* Apples, peaches, and pears nearly all killed by spring frosts. *Leavenworth:* Peach-bloom profuse, but fruitage thin; young and vigorous trees stood the winter better than old ones; small fruits abundant. *Woodson:* Peaches entirely killed; all old bearing trees killed; apples reduced one-half by blight. *Morris:* There will not be 5 bushels of peaches raised. *Reno:* But few apples. *Smith:* Very many fruit-trees planted. *Doniphan:* Peach-trees, seeded and budded, generally killed; cherry-trees largely killed; pears a failure; apples and small fruits promising.

NEBRASKA.—*Merrick:* Fruit-trees with southern exposure were ruined by snow-drifts in April. *Linn:* Have heard of no peach in the county; trees injured.

CALIFORNIA.—*Alameda:* Fruit injured by drought and frost. *Lake:* Peaches nearly all killed by frost; apples half killed. *Sonoma:* A very heavy and unusual frost visited the entire fruit region of the State just as the fruit was forming and the grapes in bloom, causing immense losses; Sonoma County, however, loses but a small percentage; peaches and grapes suffered most. *Butte:* Late frosts killed much fruit. *Mendocino:* Heavy frosts have ruined a fine fruit prospect; varieties in bloom were destroyed; apples badly injured. *Nevada:* Army-worm badly injuring fruit, especially grape-vines. *Placer:* Late frosts cut down our fruit one-half. *Napa:* Grape crop injured severely by the frosts of April 3 and 4; crop of the old vines 40 per cent. below last year.

OREGON.—*Lane:* Fruit prospect good; better than last year. *Clackamas:* Late frost injured pears and peaches, yet these crops average higher than for many years.

UTAH.—*Kane.* Fine early prospect of fruit entirely blighted.

Table showing the condition of the crops, &c., on the 1st day of June, 1873.

States.	WINTER WHEAT.		WINTER RYE.		WINTER BARLEY.		SPRING WHEAT.		SPRING BARLEY.		OATS.		CLOVER.		SPRING PASTURE.
	Acreage compared with year.	Average condition June 1.	Acreage compared with last year.	Average condition June 1.	Acreage compared with last year.	Average condition June 1.	Acreage sown this spring compared with last.	Average condition June 1.	Acreage sown this spring compared with last.	Average condition June 1.	Acreage compared with last year.	Average condition June 1.	Acreage compared with last year.	Average condition June 1.	Average condition June 1.
Maine	90	101	96	102	.....	.....	105	99	98	100	102	100	106	109	104
New Hampshire	100	108	99	108	.....	.....	99	99	98	98	101	101	101	106	105
Vermont	76	102	84	104	.....	.....	98	98	98	99	106	96	101	99	99
Massachusetts	97	103	90	107	.....	.....	93	103	102	101	100	98	103	107	100
Rhode Island	.....	.....	83	106	.....	.....	.....	.....	90	93	93	93	100	105	96
Connecticut	101	103	101	105	.....	.....	95	102	97	97	102	102	102	106	102
New York	98	92	96	98	.....	.....	96	95	93	93	100	92	100	95	93
New Jersey	99	98	101	98	.....	.....	.....	.....	.....	.....	92	91	100	70	93
Pennsylvania	101	106	100	101	96	91	95	94	90	93	98	90	101	99	100
Delaware	103	100	105	95	.....	.....	.....	.....	.....	.....	98	103	90	105	100
Maryland	103	97	101	101	.....	.....	.....	.....	.....	.....	99	100	98	88	90
Virginia	99	86	97	89	.....	.....	.....	.....	.....	.....	105	113	97	109	107
North Carolina	95	84	94	91	.....	.....	.....	.....	.....	.....	102	100	109	100	96
South Carolina	92	81	92	96	.....	.....	.....	.....	.....	.....	101	102	85	88	98
Georgia	92	85	100	95	98	97	93	93	.....	.....	101	102	126	99	104
Florida	.....	.....	105	106	.....	.....	.....	.....	.....	.....	104	108	.....	.....	103
Alabama	92	85	95	102	.....	.....	.....	.....	.....	.....	102	108	108	101	100
Mississippi	95	95	89	100	.....	.....	.....	.....	.....	.....	101	103	301	103	102
Louisiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	131	101	.....	.....	102
Texas	117	81	105	89	110	100	.....	.....	.....	.....	127	84	.....	.....	93
Arkansas	101	102	104	101	.....	.....	.....	.....	.....	.....	113	105	97	105	101
Tennessee	98	82	96	88	.....	.....	.....	.....	.....	.....	99	99	98	93	94
West Virginia	101	91	95	88	.....	.....	.....	.....	.....	.....	103	101	110	111	105
Kentucky	99	86	92	92	81	65	.....	.....	.....	.....	105	100	90	89	95
Ohio	102	96	97	100	91	94	85	73	89	89	73	85	98	103	104
Michigan	105	90	97	97	102	91	109	96	86	90	95	92	103	97	98
Indiana	100	90	91	95	80	79	.....	.....	83	105	84	94	104	103	106
Illinois	94	76	93	83	.....	.....	127	106	97	96	87	97	98	97	104
Wisconsin	104	80	99	91	.....	.....	101	101	90	100	104	100	99	83	95
Minnesota	102	88	99	101	.....	.....	134	103	98	102	128	103	102	91	99
Iowa	85	67	97	95	.....	.....	121	105	99	103	102	103	108	90	103
Missouri	98	103	97	101	97	90	125	109	115	114	106	104	105	104	102
Kansas	138	110	124	108	103	108	141	110	110	103	122	108	119	106	98
Nebraska	101	99	92	107	.....	.....	173	106	105	102	110	106	.....	.....	99
California	111	84	103	110	108	77	115	98	98	85	103	83	115	92	83
Oregon	107	106	.....	.....	.....	.....	110	106	128	102	115	101	100	100	114

Table showing the condition of the crops, &c.—Continued.

States.	MAPLE-SUGAR AND MOLASSES.		COWS AND CALVES.		SHEEP.		COTTON.		APPLES.		PEACHES.		PEARS.	
	Product of sugar this year compared with last.	Product of molasses this year compared with last.	Average condition of cows this spring.	No. calves drop'd compared with average of former y'rs.	Proportion of total number of sheep lost by disease or other casualties.	Proportion of total number of lambs dropped this spring died.	Acreage compared with last year.	Average condition June 1.	Average am't of bloom this spring.	Average condition of the crop June 1.	Average am't of bloom this spring.	Average condition of the crop June 1.	Average am't of bloom this spring.	Average condition of the crop June 1.
Maine	58	58	103	95	.05	.10	.....	.....	91	93	.....	.....	95	92
New Hampshire	48	48	103	99	.04	.09	.....	.....	91	91	100	100	103	100
Vermont	70	76	104	100	.08	.10	.....	.....	98	98	.....	.....	95	90
Massachusetts	43	43	101	99	.03	.08	.....	.....	53	96	56	73	104	101
Rhode Island	.....	.....	103	98	.07	.07	.....	.....	50	55	102	100	120	120
Connecticut	90	90	100	98	.04	.07	.....	.....	42	63	45	45	93	99
New York	87	90	97	100	.05	.11	.....	.....	93	90	71	83	106	99
New Jersey	.....	.....	97	100	.08	.12	.....	.....	81	91	70	81	97	99
Pennsylvania	87	135	98	99	.07	.12	.....	.....	84	85	42	55	83	89
Delaware	.....	.....	95	101	.05	.07	.....	.....	75	91	108	65	86	95
Maryland	.....	.....	92	98	.10	.16	.....	.....	84	86	81	80	100	96
Virginia	.....	.....	94	98	.08	.12	123	93	102	97	93	96	97	97
North Carolina	.....	.....	95	98	.13	.12	114	85	77	58	86	61	80	62
South Carolina	.....	.....	97	98	.09	.13	102	88	90	55	91	49	96	54
Georgia	.....	.....	98	98	.12	.08	114	94	90	83	96	84	97	88
Florida	.....	.....	113	105	.10	.08	103	102	.....	.....	97	82	.....	.....
Alabama	.....	.....	95	94	.16	.11	109	93	91	81	100	83	93	80
Mississippi	.....	.....	97	98	.12	.09	104	92	87	83	94	80	96	87
Louisiana	.....	.....	101	90	.13	.10	104	94	101	89	100	74	101	78
Texas	.....	.....	91	81	.08	.07	131	86	99	65	97	39	97	54
Arkansas	.....	.....	97	97	.10	.09	110	92	88	85	80	78	87	96
Tennessee	73	71	89	99	.12	.12	115	90	83	40	101	36	90	47
West Virginia	86	83	98	99	.07	.12	.....	.....	96	80	40	47	91	72
Kentucky	81	82	93	97	.11	.15	.....	.....	86	68	82	62	82	67
Ohio	107	99	97	99	.05	.11	.....	.....	92	87	30	48	90	87
Michigan	108	106	96	100	.05	.08	.....	.....	106	100	28	50	100	96
Indiana	94	94	95	98	.06	.13	.....	.....	87	82	58	51	72	75
Illinois	.....	.....	98	100	.07	.11	.....	.....	90	78	46	58	74	70
Wisconsin	111	103	95	100	.05	.10	.....	.....	104	95	.....	.....	99	87
Minnesota	98	100	96	113	.05	.10	.....	.....	87	83	.....	.....	.....	.....
Iowa	74	76	102	106	.07	.10	.....	.....	110	100	.....	.....	93	82
Missouri	100	98	98	102	.10	.17	104	96	91	86	32	35	82	73
Kansas	.....	.....	108	118	.04	.09	.....	.....	122	89	38	46	107	86
Nebraska	.....	.....	103	119	.....	.....	.....	.....	128	98	62	81	112	104
California	.....	.....	101	97	.06	.09	.....	.....	94	86	94	72	92	74
Oregon	.....	.....	110	107	.06	.07	.....	.....	163	120	141	85	110	96

LIVE STOCK.

COWS AND CALVES.—The condition of cows is full average, or above, in all the New England States, Florida, Louisiana, Iowa, Kansas, Nebraska, California, and Oregon. In the other States the depreciation varies from 9 per cent. in Texas to 2 per cent. in Pennsylvania, Georgia, West Virginia, Illinois, and Missouri. The best condition is found in the Northeast and Northwest. New England farmers have long understood the value and necessity of proper shelter and sufficient food for their stock. The severe lessons of experience have enforced the same wholesome ideas in the Northwest, and the beneficial results of extra care are seen in the satisfactory reports from these two sections of the Union. In Norfolk County, Massachusetts, however, it is stated that cows do not look as well as usual, less grain having been fed to them on account of the low price of milk. It is also stated that an unusual number of calves have been killed at less than a week old in order to sell the milk. This practice is very questionable in point of economy and not at all defensible in point of morality. Serious injury to the public health frequently results from the sale of veal prematurely butchered. In the Middle and Southern States the exceptional severity of the winter demonstrated the necessity of better treatment of farm-animals by the depreciation of condition reported by our correspondents. It is necessary to provide not merely against the average vicissitudes of winter, but also against extreme variations of temperature by proper food and shelter.

The number of calves dropped during the year as compared with previous years was above average in the following States; Nebraska, 119; Kansas, 118; Minnesota, 113; Oregon, 107; Iowa, 106; Florida, 105; Missouri, 102; Delaware, 101. It was full average, or 100, in Vermont, New York, New Jersey, Michigan, Illinois, and Wisconsin. In the States below average the depreciation ranged from 19 per cent. in Texas to 1 per cent. in New Hampshire, Massachusetts, Pennsylvania, Tennessee, West Virginia, and Ohio. In Texas the condition of cows and calves was seriously affected in several counties by the unusual severity of the winter and by the scarcity of food on the range. Coryell County reports a depreciation of 40 per cent. as compared with last year. In Southern Texas the annual increase of cattle is estimated at 25 per cent. In Grainger County, Tennessee, the "dry murrain" is destroying many cattle. In some localities cattle have depreciated in condition since the opening of spring, on account of the slow growth of grass. In Republic County, Kansas, many cattle were killed during a heavy storm, lasting through three days of April. Our limited reports from the Territories show a good condition of cattle.

SHEEP AND LAMBS.—The losses of sheep from diseases and other casualties vary from 16 per cent. in Alabama to 3 per cent. in Massachusetts. The heaviest losses are in the late slave States, which report percentage of loss as follows: Maryland, 10; Virginia, 8; North Carolina, 13; South Carolina, 9; Georgia, 12; Florida, 10; Alabama, 16; Mississippi, 12; Louisiana, 13; Texas, 8; Arkansas, 10; Tennessee, 12; West Virginia, 7; Kentucky, 11; Missouri, 10. These severe losses are partly due to the unusual severity of the winter, but are generally attributed by our correspondents to the immense number of worthless dogs kept by the freedmen and others. The losses of New England range from 3 per cent. in Massachusetts to 8 per cent. in Vermont. North of the Ohio River, Ohio, Michigan, Wisconsin, and Minnesota report

5 per cent.; Indiana, 6; Illinois, 7; west of the Mississippi, Kansas and Nebraska lost but 4 per cent.; the Pacific States, 6 per cent.

The mortality among lambs was most severe in Missouri—17 per cent.; Caldwell and Vernon Counties report a loss of 40 per cent. each; Cass, Douglas, and Daviess, 33 per cent. each, and other counties heavy losses. Maryland averages 16 per cent., the heaviest losses being in Montgomery County, 40 per cent.; in Cecil, 30 per cent., and in Washington, 20 per cent. Of the New England States, Maine and Vermont lost 10 per cent. each, the other States varying from 7 to 9 per cent.; the Middle States range from 7 to 12 per cent.; the South Atlantic States from 8 per cent. in Georgia to 16 per cent. in Maryland; the Gulf States from 7 per cent. in Texas to 11 per cent. in Alabama; the interior Southern States from 9 per cent. in Arkansas to 15 per cent. in Kentucky; the States north of the Ohio River from 8 per cent. in Michigan to 13 per cent. in Indiana; the States west of the Mississippi River from 9 per cent. in Kansas and Nebraska to 17 per cent. in Missouri; on the Pacific coast California averaged 9 per cent. and Oregon 7 per cent.

MAINE.—*York:* Farmers are raising all their calves, but few colts. *Somerset:* Sheep have come out well this spring; very few lambs have died. *Androscoggin:* Cows and calves less in number than last year.

VERMONT.—*Franklin:* Unusual number of deaths among sheep and lambs; not to be attributed to any particular disease, but in most instances to indifference and neglect, which generally result from depressed prices and gloomy prospects. All other stock wintered well, and in fine condition.

MASSACHUSETTS.—*Middlesex:* Cattle came out in excellent condition. *Norfolk:* Cows do not look as well as common; less grain has been fed to them on account of the low price of milk. Large numbers of calves are killed less than a week old, so as to sell the milk.

NEW JERSEY.—*Hudson:* Cattle wintered well. Sugar-beets found to be an excellent feed for milch-cows.

PENNSYLVANIA.—*Washington:* Horses plenty and cheap. *Cumberland:* Very few sheep kept.

MARYLAND.—*Howard:* The scarcity of feed brought cows to grass in poor condition. *Cecil:* The unusually cold weather was very fatal to lambs.

VIRGINIA.—*Spottsylvania:* Cattle look well; an increase of calves. *Madison:* Generally in good condition. *King George:* Loss of sheep mainly by dogs; very few by disease. Lambs perished during the cold and variable weather of February and March. *Henrico:* Fine condition of cows, owing to fine grass-crop. *Washington:* Cows very poor, but healthy. Calves doing well. Winter very severe on sheep and lambs; great loss of lambs. *Mecklenburgh:* Very fine sheep in this county. Fully one-third of the lambs dropped have died.

SOUTH CAROLINA.—*York:* Cattle look well; cows and calves are fatter than usual so early in summer; there is some disease prevailing among cattle in the western part of the county, the character of which I have not learned; a considerable number have died; sheep-husbandry will soon be abandoned here; only a few pretend to keep anything like a flock. *Georgetown:* Horned cattle are decreasing in numbers rapidly; sheep too few to take account of.

GEORGIA.—*Columbia:* Cattle rallying from the severe winter. *Heard:* Sheep scarce; stock in low condition.

ALABAMA.—*Conecuh:* Cows in much better condition than last year, and consequently more calves. *Autauga:* A large number of cattle have died from poverty. *Coffee:* Stock of all kinds come out well. *Jefferson:* The loss of sheep nearly all by dogs. *Clay:* The everlasting dogs are after our sheep, and hundreds perish annually by this pest; but for them our county is finely adapted to sheep-raising.

MISSISSIPPI.—*Holmes:* Sheep have suffered from dogs; lambs and stock of all kinds from the severity of the winter, the hardest known in the South for many years. *Attala:* The freedmen are keeping a large supply of dogs, and until this matter is regulated by law, sheep-raising is at an end here.

LOUISIANA.—*Terre Bonne:* Since the war but few sheep have been produced in this county, though it is well adapted to them. *Franklin:* Cows considerably below average condition, not having fully recovered from the effects of the severe winter.

TEXAS.—*Hays:* The cows came out of winter on the range very poor, but are now rapidly improving. But few sheep in the county; they are doing well. *Coryell:* Cows not in as good condition as last year by 40 per cent. *Galveston:* The annual average increase of cattle in Southern Texas is about 25 per cent.

ARKANSAS.—*Arkansas:* Cattle looking well; sheep looking finely, but not many of them.

TENNESSEE.—*Cross:* Cows are improving very fast. *Grainger:* Cattle dying with the "dry murrain."

WEST VIRGINIA.—Braxton sheep lost 10 per cent., lambs 15 per cent., from diseases and other casualties. *Nicholas:* Sheep not so well; dog ravages increasing. *Tyler:* Cattle wintered on short allowance. *Harrison:* Beef-cattle a little below average: horses in good condition.

KENTUCKY.—*Fayette:* Live stock thin.

OHIO.—*Jackson:* Live stock came out of winter quarters in splendid condition. *Warren:* Many sheep killed by dogs.

INDIANA.—*Grant:* Stock in good condition. *Kosciusko:* Dogs have greatly injured sheep.

ILLINOIS.—*Winnebago:* Cattle not looking so well as April 1; sheep largely destroyed by wolves, which are increasing, in spite of all efforts for their destruction. *Scott:* Spring pigs have not done well. *Ogle:* Sheep and lambs generally healthy. *Montgomery:* Large numbers of sheep killed by wolves and dogs. *Boone:* Unusual mortality among lambs; sheep too highly corn-fed.

WISCONSIN.—*Jefferson:* Live stock affected by scarcity of food, especially cattle. *Iowa:* Late cold spring severe on cattle.

MINNESOTA.—*Faribault:* Many lambs lost through wet weather.

IOWA.—*Montgomery:* Fewer calves dropped this season; cows failed to get with calf last season. *Polk:* Stock wintered well; cows and calves of good quality; no sheep lost. *Guthrie:* Decreasing number of calves born, in consequence of a scarcity of bulls.

MISSOURI.—*Polk:* Cattle look well; some died of exposure. *Caldwell:* Lambs dropped mostly in winter; 60 per cent. lost. *Ste. Genevieve:* Dog interest has destroyed sheep husbandry. *Crawford:* A large amount of live stock died of starvation and exposure.

NEBRASKA.—*Merrick:* Sixty per cent. of the sheep perished in April storms.

KANSAS.—*Republic:* Cattle, after wintering in good order, are thin for lack of spring-feed; many killed in the heavy three days' storm of April. *Atchison:* Large per cent. of lambs winter-killed. *Doniphan:* Stock of all kinds doing well.

CALIFORNIA.—*Kern:* Most of the sheep lost died either of starvation or of eating poisonous weeds; about a fourth of the cattle were driven out of the county last winter. *Alameda:* Sheep wintered well; 90 to 95 per cent. of lambs saved; many flocks produced as high as 110 per cent., so many of the ewes bearing twins. *Mendocino:* Sheep remarkably exempt from their usual casualties.

COLORADO.—*Huerfano:* Cattle and sheep doing very well; young animals strong and healthy; lamb-crop splendid. *El Paso:* Losses of sheep entirely due to mismanagement.

IDAHO.—*Nez Perces:* Cattle wintered finely, and are very fat. Epizooty just making its appearance. *Sevier:* Sheep and cows do well.

ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

THE TWIG-GIRDLER.—Mr. G. F. B. Leighton, president of the Norfolk (Va.) Horticultural and Pomological Society, in a letter to this Department, in answer to some questions relating to the twig-girdler, *Oncideres cingulatus*, states that during the past season he has made some interesting observations which may be of interest to entomologists and horticulturists. After remarking on the habits of the insect, he states that a close scrutiny revealed the fact that the insects girdle the twig before depositing their eggs, although he supposed it otherwise the previous season; he also recommends burning the twigs, as spoken of in the report of 1871.

THE COLORADO BEETLE.—Mr. David Peeler, of Johnstown, Cambria County, Pennsylvania, reports the Colorado potato-beetle in considerable numbers. The first brood had attained maturity June 8, and he

says that no doubt other broods will be more numerous, and fears great destruction.

Mr. Chamberlain, editor of the Saint Joseph Herald, Michigan, has forwarded undoubted specimens of the *Doryphora decem-lineata*, covered with a parasitic mite of a dirty reddish-brown color, and very much resembling a mite *Uropoda*, which also infests dung-beetles. These mites adhere to certain dung and carrion beetles, by the tail or a long tube. Dr. Packard, however, states that they attach themselves to their host by a product like silk, which hardens on exposure to the air.

APPLE-TWIG BORER.—*Amphicerus* (*Bostrichus*) *bicaudatus*, or the apple-twig borer, has been very plentiful and injurious in the West and Northwest on apple twigs, grape-canes, &c.

INSECT INJURIES—The farmer's insect enemies have already demonstrated their mischievous presence in different parts of the country. The Hessian fly (*Cecidomyia destructor*) is at work in the wheat-fields of Kent County, Delaware; Fulton County, Pennsylvania; Clarke, Loudoun, and Rockingham Counties, Virginia; Berkeley County, West Virginia; and Stone and Maries Counties, Missouri.

Different species of the *Agrotis*, commonly designated as cut-worms, have begun their ravages in corn, cotton, and other crops in the South and West, especially in the following counties, viz: Queen Anne, Maryland; Clarke, Virginia; Suwannee, Florida; Morgan, Alabama; Woodruff, Arkansas; Greene and Gibson, Tennessee; Lucas, Ohio; Warren, Wells, Posey, and Pike, Indiana; Perry and Bond, Illinois; and Nodaway, Missouri. In many localities these pests are very numerous. In Bond County, Illinois, the late hot weather killed many of them. They were also destructive in the winter-grain of Bourbon County, Nebraska.

The chinch-bug (*Micropus* [*Rhyparochromus*] *leucopterus*) is reported in several counties west of the Mississippi River as depredating upon wheat, oats, and young corn. The injuries were not very perceptible at the date of our reports, but the immense numbers of the insects give very great uneasiness as to the future. They were numerous in Perry County, Illinois; in Benton, Boone, Franklin, Perry, Pulaski, Jasper, and Maries Counties, Missouri. Some complaints also come from Butler, Neosho, and Labette Counties, Kansas.

Two species of the grasshopper, the *Caloptenus spretus*, and the *C. femur-rubrum*, have done very considerable mischief already. From our reports, it is not easy in all cases to decide which of these species is operating in a particular locality. Their most serious ravages appear to have been in Texas, and in the States and Territories west of the Missouri River. In Palo Pinto County, Texas, they had nearly destroyed the wheat and oats. They were also very destructive in San Saba, Gillespie, Burnet, Bandera, Medina, Atascoosa, and Lampasas Counties. In Medina County they hatched till May 5, when they left on a grand northern summer tour. In Atascosa County they ate up cotton and all kinds of vegetation, and the second planting of crops was entirely destroyed. In Monroe County, Iowa, swarms of "red-legged locusts," *C. femur-rubrum*, had arrived on the 28th of May, and were supposed to have come from Texas. The same were devouring the winter-grain in Cuming County, Nebraska. In Hall County they appeared ten weeks earlier than last year. Immense masses of them passed through Burt County northeastwardly, leaving detachments strong enough for serious mischief behind them. They appeared in Clay County, Dakota, May 28. They appeared earlier and more numerous than ever in Edwards County, Illinois.

The cotton-caterpillar, or army-worm, (*Anomis xylinæ*,) appeared in Decatur County, Georgia, May 30, along Flint River. They appeared about the same time in Jackson and Gadsden Counties, Florida, about twenty days earlier than usual. They had also made their appearance in Marion County, Mississippi. In Atascosa County, Texas, they were sweeping the third planting of cotton, the first two plantings having been destroyed by grasshoppers. They had also made their appearance in Victoria County.

The grass army-worm (*Leucania unipuncta*) was destroying the clover in Bedford County, Tennessee. They were also reported in Posey County, Indiana, and in Williamson, Edwards, and Perry Counties, Illinois.

The apple-tree caterpillar (*Clisiocampa*) entirely denuded the fruit-trees of Gibson County, Tennessee. They were also destructive in Union County, Indiana, and Edwards and Wayne Counties, Illinois. In Nevada County, California, an undescribed insect inflicted great injury upon garden vegetables and fruits, especially grape-vines. It preferred to feed upon the young and tender shoots, but did not slight the older ones.

The grub-worm (*Lachnosterna fusca &c.*) was also injurious to various crops in Humphreys County, Tennessee.

In Rapides Parish, Louisiana, cotton is reported as covered with *Aphides*.

In Franklin County, Ohio, apple-orchards, within a few days, have been attacked by a black or dark brown worm, $1\frac{3}{4}$ inches long, the description of which is too meager to identify it. It appears by millions, stripping the trees of both fruit and foliage. They have lately attacked also the forest-trees. They have been observed for two or three years past, but the number has enormously increased. In every case in which hogs have been turned into the orchard this insect has disappeared. It is possible that this may be a *Clisio campa*, of which one species, *C. sylvatica*, attacks forest-trees, and another species, *C. disstria*, fruit-trees, &c.

Potato-bugs are numerous in West Virginia and States further West. Though our reporters are not always careful to distinguish them, it is pretty evident, however, that in most, if not all, cases the Colorado potato-beetle (*Doryphora decem-lineata*) is meant. The counties in which this insect has been observed the present season are the following: Jackson and Pleasants, West Virginia; Highland, Licking, Wyandot, Lucas, and Adams, Ohio; Van Buren, Michigan; Marion and Wells, Indiana; and Putnam, Illinois. Newspapers published in Northern Ohio state that on the 22d of May several immense swarms of Colorado beetles passed through the town of Chasden westward, and that their ravages were very serious. In Adams County, Ohio, the lady-bug (*Coccinella*) was present in great numbers, devouring the eggs of the Colorado beetle. Specimens of the latter insect have been received from Michigan, infested with small parasitic mites, a species of the *Uropoda*.

In Braxton County, West Virginia, the borer (*Ægeria* [*Trochilium*] *exitiosa*) killed some peach-trees. In Union County, Indiana, forest-trees have been damaged by measuring or span worms. In Nez Percé County, Idaho, crickets were destructive of grain crops along the rivers.

CHEMICAL MEMORANDA.

By William McMurtrie, Chemist.

Analysis of wines.—Since the publication of our last monthly report we have been led to make some examinations of wines, with a view to the determination of a means of distinction between the alcohol of fermentation and that of distillation, and the amounts of these constituents which any given wine contains. Our attention was drawn to this subject by the receipt, from Hon. J. N. Douglass, Commissioner of Internal Revenue, of a sample of "Sonoma sparkling champagne," manufactured by J. N. Blum, of New York State, and seized in New Orleans according to the law providing for the taxation of all wines of American manufacture containing more than 5 per cent. of absolute alcohol produced by distillation. The object of the examination in this case was, therefore, to determine whether the wine was produced by the natural process of fermentation, or by the use of brandy or other alcoholic fluids, thus placing it within the limits of the above-mentioned law. The only reliable method for making such distinctions consists in determining the total amount of alcohol which the given wine contains, and considering all above a certain per cent., generally 12 to 14, which is known to exist in a normal wine, as alcohol of distillation. This is, of course, only approximate, on account of the variation in the composition of different wines.

Other experiments for the determination of the purity of wines were made, with a view to proving the presence of adulterations, but they gave negative results. According to Beyse, Bolley, Neubauer, and other chemists who have devoted years to the study and investigation of wines and their manufacture, the separation and determination of the two varieties of alcohol spoken of is impossible. In the course of our investigations we procured, for comparison, a specimen of "Imperial champagne," manufactured by the American Wine Company of Saint Louis, and have made complete analyses of the two, obtaining the following results, in parts per thousand:

No. 1.—"*Sonoma sparkling.*"

Alcohol by weight	107.7
Alcohol by volume	133.0
Extractive matter	102.1
Ash	1.9
Acid (calculated as free tartaric)	6.5

No. 2.—"*Imperial.*"

Alcohol by weight	97.5
Alcohol by volume	122.0
Extractive matter	129.8
Ash	1.4
Acid (calculated as free tartaric)	5.5

Marls.—The following are the results of analyses of calcareous marls: No. 1, sent to this Department by J. L. White, Iola, Marion County, Florida; and No. 2, sent by H. R. Pollard, from Stevensville, Virginia:

No. 1.

Moisture (determined at 130° C)	1.11
Organic and volatile matters	1.07
Peroxide of iron and alumina	1.24
Lime	49.92

Magnesia	2.24
Potash	0.04
Soda	0.13
Carbonic acid	37.82
Phosphoric acid	0.70
Sulphuric acid	0.32
Insoluble matter, silica, &c	5.41
	100.00

No. 2.

Moisture (determined at 100° C)	0.48
Organic matter and moisture not expelled at 100° C	3.76
Peroxide of iron and alumina	1.78
Lime	44.28
Magnesia	1.04
Potash	0.11
Soda	0.31
Phosphoric acid	0.19
Sulphuric acid	0.25
Carbonic acid	34.83
Silica, &c	12.97
	100.00

MUCK.—During the month of February we received from Mr. Luman Andrews, Southington, Connecticut, samples of muck for the purpose of determining the probable composition of a white coating which appears upon the surface of it when thrown out in heaps. The substance was in small scales or crystals. It is of course difficult to state positively what may be its composition, but from the analysis given below it is evidently some soluble sulphate.

The analysis resulted as follows:

Moisture, (determined at 100° C)	3.77
Organic matter and moisture not expelled at 100° C	27.22
Nitrogen	1.09
Protoxide of iron	2.40
Peroxide of iron	Trace.
Alumina	3.32
Lime	1.29
Magnesia	1.01
Potash	0.41
Soda	0.14
Phosphoric acid	0.10
Carbonic acid	Trace.
Sulphuric acid	1.15
Silica, &c	58.10
	100.00

The residue remaining after removing the organic and volatile matters, by incineration, is very fine and pulverulent.

FERTILIZER.—The following are the results of a complete analysis of a sample of fertilizer manufactured in Washington, D. C., and presented for analysis by Mr. S. T. Suit, corner of Pennsylvania avenue and Thirteenth street:

Organic matter and moisture	21.93
Nitrogen (equivalent to 1.34 per cent. ammonia)	1.10
Protoxide of iron	2.50
Peroxide of iron	Trace.
Alumina	5.04
Lime	4.56
Magnesia	1.11

Potash	0.92
Soda	0.27
Chloride of sodium	0.74
Soluble phosphoric acid	Trace.
Insoluble phosphoric acid	2.07
Sulphuric acid	0.96
Carbonic acid	1.27
Silica, &c	57.53
	100.00

NOTES.

SUGAR.—It being a well-known fact that the crystallization of sugar is materially affected by the presence of mineral matter in the solution, M. Monier conceived the idea of estimating the amount of ash contained in corresponding sugars, with a view to the determination of the amount of crystallizable sugar therein contained. He found that multiplication of the weights of ash by the co-efficient 5, and subtracting the product from the number obtained by the saccharimetrical test, left a remainder which indicated the weight of refined sugar which should be obtained from the product to be treated.

Suppose that titration of a sugar solution shows 95 degrees and 1.50 of ash. The latter weight multiplied by 5 gives 7.5, which subtracted from 95 leaves a remainder of 87.5, representing the quantity of sugar which may be produced.

AGARICUS FŒTENS.—The following are the results of an analysis of *Agaricus fœtens*, made by Mr. Sacc:

Water	67.20
Mannite	0.60
Pectic acid	0.09
Fibrin	4.66
Bassorin	1.55
Lignin	20.09
Fat, acid, odorous and coloring matter	0.68
Ash	5.13
	100.00

TOBACCO.—It is generally well known that when evil effects, or indeed any effects whatever, follow the use of tobacco, they are due to the nicotine contained in the leaf. M. Heubel has shown, from certain investigations upon the chemical properties and poisonous action of tobacco-fumes, that, since the alkaloid is practically inactive in the free state, it is probable that the nicotine is contained in the leaf in the state of a salt.

GROWTH OF TREES.—M. Breuil states that, while visiting a small park connected with the Chateau d'Compeigne, he observed that some of the horse-chestnut trees had been decorticated to a height of 30 to 40 centimeters, and ascertained that this condition had existed a long time. Being surprised to find the trees living in this condition, he determined to seek the cause of this unusual continuation of vitality. Knowing the possibility of plants receiving their nourishment, in the way of organic matter, from the atmosphere, he determined upon an estimation of the percentage of mineral matter contained in the wood of the part decorticated and that above it, in order to find the possible source of this important element so necessary to the healthy growth of plants. The following statement indicates the proportions of ash contained in the different parts:

	Per cent.
Part decorticated	0.916
Part not decorticated	0.413

The latter, therefore, contains but about one-half as much mineral matter as the former, leading to the belief that the fluids circulating by osmose furnished the mineral matter to the growth of the new wood at the expense of the old, which seems quite evident from the following:

Woody layers subjacent to the bark	1.20 per cent. of ash.
Woody layers situated below the former	0.70 per cent. of ash.

In order further to establish this fact a sample of wood from a tree of normal growth was taken, the determination of the ash of which shows that the inner woody layers contain a much larger proportion of ash than the outer layer, thus:

Central woody layers contain	1.48 per cent. of ash.
Exterior woody layers contain	0.92 per cent. of ash.

TANNING-MIXTURE.—The following formula for a tanning-mixture has been given as applicable to all kinds of skins.

For 100 pounds, take 10 pounds tobacco-root, 60 pounds caochou, 20 pounds sumac.

It is stated that 100 pounds of this mixture in 125 pounds of water will tan hides completely in six days and prepare them for the currier.

EFFECT OF MANURES UPON CINCHONAS.—Mr. Broughton, of the Ootacamund plantation, in the department of Madras, has shown that while manure fails to effect an increased and more vigorous growth of cinchonas, it produces a much greater alkaloidal yield. Thus, some plants of *Cinchona succirubra*, three years old, treated each with one pound of sulphate of ammonia and a like quantity of guano, show the following proportions of alkaloids, compared with those unmanured:

	Manured.	Unmanured.
Total alkaloids	7.25	4.89
Quinine	2.45	1.78
Cinchonidine and chinchonine	4.80	3.11

Treatment with guano gave the following results:

	Manured.	Unmanured.
Total alkaloids	5.29	4.76
Quinine	0.91	1.04
Cinchonidine	4.38	3.72

These results show that the use of guano is unprofitable, and Mr. Broughton recommends that *C. succirubra* be grown without its use.

C. officinalis, which is much more sensitive to the various conditions to which it may be subject when treated with one pound of guano to each plant offers the following comparison:

	Manured.	Unmanured.
Total alkaloids	6.51	3.98
Pure quinine	4.41	2.40
Cinchonine and cinchonidine	2.10	1.58

The same, treated with three-quarter pound sulphate of ammonia to each tree, shows:

	Manured.	Unmanured.
Total alkaloids	5.76	4.54
Pure quinine	3.11	2.54
Cinchonidine and cinchonine	2.65	2.00

Treated with about four barrow loads of farm-yard manure, they show:

	Manured.	Unmanured.
Total alkaloids	7.49	4.68
Pure quinine	7.15	2.40
Cinchonidine and cinchonine	0.34	2.28

It seems therefore that farm-yard manure is more valuable in this particular than artificial manure, since it favors the production of quinine rather than cinchonidine and cinchonine.

HEATING OF WINES.—The work of ascertaining and removing the cause of the deterioration of wines has, for a long time, been the subject of many experiments among European chemists, and the question arising at the outset, whether the agent employed for the prevention of the disease produced by a certain microscopic fungus would affect, with other matters, the bouquet of the wine, was one which could be answered only by time and experience. To this end, at the suggestion of Pasteur, several brands of wine which had been subjected to a temperature of 50° to 75° C. were stored in the cellar of the Normal School of Paris, alongside of some which had not been thus treated. In 1869 the different brands were tested by the *Commission Syndicale de vins de Paris*, when it was found that the heated wines were superior to the other brands. In 1872, again at Pasteur's suggestion, a second examination was instituted by other experts, who embodied the results of their investigations in a protocol showing that, with regard to twelve brands, those which had been heated were superior to those which had not been thus treated; with regard to three brands, that which had not been heated was equally as good as that which had been heated; and of nine brands, that which had been heated was good, while that which had not been heated was spoiled. Referring to the protocol, Pasteur states that heating may be regarded as a very efficient agent for preserving the quality of common as well as of choice wines. Experiments of six to seven years duration have shown that even the finest wines, when suddenly subjected to a temperature of 55° to 65° C., are not only no longer subject to disease, but are improved, attaining a quality superior to that produced by age in the absence of disease.

To some of the statements of the protocol Pasteur made objections. Thus it was concluded that heating gradually affects the color and bouquet of choice wines, but he holds that by heating the former becomes much more brilliant while the latter is improved, which fact is fully illustrated in the wines of Chambertin and Volnay. It was also recommended that the wines be subjected for several months to a low temperature, but this he has shown to be unprofitable. He further states that it is better to heat new than old wines, and insists that when they are to be heated in quantity, they must be kept in the apparatus employed in the same quantity as in bottles before, during, and after the heating, and that the air must be, as far as possible, excluded, since it may give rise to a flavor like that imparted by boiling which is generally unpleasant. The want of success which has so often attended the heating of wines on a large scale is due to the failure to observe these precautions.

EUCALYPTUS GLOBULUS.—The following communication, descriptive of the *Eucalyptus globulus* and its properties, was lately furnished to this Department by M. Stanislaus Martin, president of the Society of Pharmacy of Paris:

The eucalyptus is a large and lofty tree of the myrtaceæ family, the *Icosandria monogynia* of Linnæus. It was discovered in Van Dieman's Land in 1792, by Labillandiere. There are thirty varieties of this tree, the growth of which is very rapid: its wood is as hard as that of the oak, and is suitable for house and ship carpentry, and for cabinet-work.

The word eucalyptus signifies *fully capped*. The distinctive character of the tree consists in a kind of conical cap that covers the bud, which is thrown off as the stamens expand. This cap forms the limb of the calyx, the base of which adheres to the ovary. There is no corolla; the numerous stamens are attached to the apex of the tube of the calyx. The ovary is inferior, and bears a style and single stigma; the fruit is a capsule of four polyspermous cells; the flowers are usually of a yellow color, and emit a strong resinous odor; they form in groups, or appear singly at the axes of the leaves.

These trees abound in the forests of New Holland, and have been transplanted to Africa, from thence to Spain, and afterward to France. They thrive marvellously, commonly attaining a height of more than a hundred feet. The trunk grows straight to the distance of half its height; the branches become crooked as they are developed; the bark is of a dark gray color, and detaches itself from the tree. The leaves are of various sizes; some of them are more than 4 inches in length and over 2 inches in breadth; twenty of these leaves, about 2 inches wide and 2½ inches long, weigh, when dried, 8 grams. The color of the leaf is a deep gray; its outer surface is of a greenish-blue tint, while the inner surface appears to be covered with a whitish powder; viewed through a microscope, the vesicles filled with essential oil may be seen. Their flavor is warm and aromatic, similar to that of peppermint when added to a little turpentine; to this sensation there succeeds a bitter-sweet taste.

The leaves of the eucalyptus are highly prized in certain portions of Spain; at Cordova, for example, where they are prescribed as a substitute for quinine. Mons. Renaud employed a great number of workmen in this city. As soon as any of these felt the symptoms of intermittent fever, he compelled them to take a gram of this leaf, reduced to powder, three times a day; they were invariably cured in a few days.

On the 6th of March, 1867, the writer of this article presented to the Society of Pharmacy, of which he is the president, a flask of the volatile oil of the eucalyptus and a sample of the plant.

This essence possesses an aromatic odor; it is colorless and of a fluidity equal to the essence of mint. Placed in contact with nitric acid, it acquires consistency and becomes resinous. It is believed that its action is antiperiodic. It would be interesting to ascertain if the leaves of the eucalyptus, when cultivated in France, would obtain the same properties as those which are taken from the trees of Spain and Africa. Our malarial fevers would, in this case, yield to this agent, and it would also be a great economy to the poor classes, as the sulphate of quinine is at the present time, and will long continue to be, of a very high price, although we have no fear that the precious cinchona tree will disappear for many years to come.

The following communication is of later date:

* * * * The *Eucalyptus globulus*, which we first brought to the attention of the learned world and of therapeutists, has at length, we hope, taken its proper place in the medical practice. Mons. Ramel had the honor of introducing this magnificent and valuable vegetable production into Europe; Messrs. Cloez, Gimbert, Regulus Carlotti, and Tristamy have acquainted us with its chemical composition and its therapeutic effects, but Professor Gubler alone has given us a complete work upon this subject.

Let us hope that speculation and infatuation will not seize upon this plant for commercial purposes, a misfortune that has too often attended important discoveries.

We have received barks of the *Eucalyptus globulus* from the north of France and Australia, compared them with those of Africa, and are prepared to admit that those barks and leaves that are obtained from warm climates should be employed in preference to others.

It is well known that vegetation, in every period, increases its bulk by means of materials that it gathers from without; that among certain *dicotyledonous* trees this increase takes place in the exterior layer of the liber or inner bark of the tree; that this phenomenon operates very slowly in certain vegetables and rapidly in others.

The *Eucalyptus globulus* increases with great rapidity. In Australia the leaves and bark are rich in essential oil, which exudes whenever the bark or a leaf is rent by an insect or any foreign body. This essence, coming in contact with the atmospheric air, forms little globules that are detached by the action of the wind.

As it is much more easy to procure barks from Africa than from Australia, those of Africa should be used for therapeutic purposes.

These barks are classified as young, living, and dead barks. The very young barks have no aroma, and are rolled together; their color is analogous to that of the cinnamon of China. Those which are naturally detached from living trees are very good; those procured from dead trees are worthless. Viewed through a microscope they appear to be covered with a cryptogamous vegetation, which defaces them. Barks of dead trees have little odor, are easily separated, and weigh a third less than those taken from living trees.

The barks of the eucalyptus are composed of layers methodically superposed, which are susceptible of division after a long steeping in water. The laminæ are formed by

longitudinal fibers held together by a substance to which chemists have given the name of *entraites*, or tie-beams. The interior of the bark is smooth and of a deep yellow color; a branch of the eucalyptus deprived of its leaves has a fibrous consistency; this fibrous nature disappears as the wood grows old. The taste of the living barks is more decidedly aromatic than that of the dead barks, and both leave in the mouth but little of their soluble principles; for commercial purposes and for the extraction of the essence the leaves should be employed.

The writer has another article on the chemical composition of the essence of this plant. Since the introduction of the eucalyptus, the plant has been the subject of many articles, the most complete of which has been published by Mons. Gubler in the Therapeutic Bulletin.

As I have foreseen, quackery has overstated the properties of the plant, and it will happen to this as to others that its popularity will be ephemeral, because its virtues have been exaggerated.

Undoubtedly the papers of Paris will maintain that this plant has little virtue. To-day they announce a syrup, a powder, an alcoholate, an aqueous or alcoholic extract of eucalyptus,

The globules of the eucalyptus are now in vogue, and those who are striving to turn them to profitable account have exaggerated their virtues, much to the prejudice of the plant. It is an antiperiodic and a stimulant; it acts only by the essential oil which it contains. It is not necessary to attribute any other virtues to it.

A NEW CEMENT.—By a series of experiments Dr. Grünberg has succeeded in preparing a cement from *Kieserite*, an associate and constituting about 12 per cent. of the so-called *Abraunsalze* of the salt deposits of Strassfurt, Prussia. By mixing, in presence of sufficient quantity of water, one equivalent (36 parts) of hydrate of lime with two equivalents (138 parts) of kieserite, consisting of water and sulphate of magnesia in equivalent proportions, he obtained a pasty mass which, upon heating, afforded a solid compound, composed of sulphate of lime and sulphate of magnesia, plus magnesia, which seemed devoid of useful properties. However, if the pasty compound be strongly ignited, pulverized, and mixed with water, a solid mass is instantly produced, which in hardness resembles marble rather than gypsum, and is capable of being polished and of withstanding the action of moisture.

SUGARS OF THE THIRD CRYSTALLIZATION.—Comptes Rendus of March 10 contains a memoir upon "raw sugars of the third crystalliza, tion," by M. Ch. Violette, from which he draws the following conclusions -

1st. Sugars of the third crystallization of the north of France contain besides the sugar and earthy matters, the mineral and organic princi ples of the molasses.

2d. Molasses especially rich in chloride of potassium may, in certain conditions, furnish sugar of the third crystallization of composition very different from that of the ordinary sugars of the third crystallization. These sugars may contain considerable quantities of sucrate of the chloride of potassium, isomorphous with cane sugar.

3d. The method of incureration of sugars by the addition of sulphuric acid, at present in general use, gives amounts of ash above the normal weights of that of raw sugars. The difference is greater as the ashes are richer in soda salts and alkaline carbonates.

4th. The ash of the raw sugars of the north in question represents three-fourths the weight of salts contained in the sugars.

BOTANICAL NOTES.

By Dr. George Vasey, Botanist.

Fertilization of wheat and other grasses.—In the monthly report of this Department for October last is an article by the Commissioner on the "Cultivation and hybridizing of wheat," in which are given the results of some observations made by his direction, which results confirmed his opinion that the fertilization of wheat was effected in the closed flower, and hence that hybridization does not naturally occur between different varieties growing in close proximity. This subject, in its reference not only to wheat but to other grasses, appears to have also received some attention in Germany, particularly by Professor Hildebrand, of Frieburg, and is made the subject of a paper read by him before the Berlin Academy of Sciences, October 31, 1872.

A brief synopsis of this paper, from a translation published in the (London) Gardener's Chronicle and Agricultural Gazette, is as follows:

With respect to their floral structure grasses may be classified under the following heads:

1. *Diœcious grasses.*—Here, the two kinds of floral organs, viz, stamens and pistils, grow on distinct plants, one portion producing only staminate flowers, and the other portion producing only pistillate flowers. There is but a small number of species of this class. The buffalo-grass of the plains (*Buchlœ dactyloides*) is one of them.

2. *Monœcious grasses.*—In this class the staminate and pistillate flowers occupy different parts of the same plant. In Indian corn (*Zea mays*) the staminate flowers occupy the summit of the plant, while the pistillate are arranged upon an axis proceeding from a lower portion of the plant. In wild rice, (*Zizania aquatica*) the fertile flowers occupy the upper part of the panicle, and the staminate flowers the lower part.

3. *Polygamous grasses.*—Here a portion of the flowers may be perfect, that is, combining both sexes, and a portion will be either wholly staminate or wholly pistillate. Some species of *Panicum* and of *Andropogon* are of this description.

4. *Perfectly flowered grasses.*—This includes the larger portion of grasses, especially of temperate climates. In this division fall also most of our cultivated grains, as wheat, oats, and barley.

In grasses of the first class, *i. e.*, diœcious grasses, the pistillate flowers must necessarily be fertilized by the pollen from entirely distinct plants, just as among higher plants the pistillate willow is fertilized by the pollen from the male willow of the same kind but on a different tree. On the western plains where the buffalo-grass prevails, large patches may be found having only male flowers, and other patches occur having only female flowers. The seed of course is only produced upon these female or fertile plants. Until this fact was discovered, the two sexes were supposed to be different species, and were known by different names.

In the monœcious grasses also, as in the common Indian corn, (*Zea mays,*) the pistillate flowers must be fertilized from without; the pistils are thrust out from the husky covering and exposed to the influence of any pollen which may fall upon them; hence the readiness with which different varieties, if planted in proximity, hybridize or mix with each other. The same is true to a large extent with polygamous grasses.

In the case of the perfectly flowered grasses, we find several provisions existing, which affect the mode of fertilization.

1. In some species, as in the sweet-vernal grass, (*Anthoxanthum*,) the stigmas are thrust out of the flower some time in advance of its own stamens, and are fertilized by pollen from earlier developed flowers. A similar arrangement exists in the meadow-foxtail (*Alopecurus*) and many other grasses. In these cases there is usually only a short period during which the pistil remains fresh and capable of fertilization; in *Phalaris arundinacea*, however, Professor Hildebrand found the stigmas fresh and receptive for a longer time.

2. In by far the larger number of grasses the male and female organs mature at the same time in the same flower; but even here there are circumstances which in some species seem favorable to self-fertilization, and in others to cross-fertilization. Thus, in rye, the anthers are partly extended beyond the points of the inclosing chaff, before the full expansion of the flower, so that the pollen first shed goes to the fertilization of other flowers which are already open. When the flower fully expands, and the rest of the pollen is shed, only a portion is likely to fall upon the stigmas of the same flower owing to the relative position of the parts, the greater portion being conveyed to other flowers. In the common oat (*Avena sativa*) the flowers, in *dry weather*, open in the afternoon and toward evening. The anthers hang out of the flower, and the pollen is, to by far the greater extent, dispersed to other flowers; but in damp and cold weather the flowers remain closed, the pollen is shed within the flower, and self-fertilization is inevitable. The flowers of rice (*Oryza sativa*) open in the morning, and the arrangement is nearly the same as in the oat, favorable to cross-fertilization.

In all the observations made by Professor Hildebrand on different species of barley, *no* flowers were found to be open, but all were self-fertilized, even before the spike or head was protruded from its sheath. However, another observer, Delphino, asserts that there is at least the possibility of cross-fertilization in barley. He states that the spike of *Hordeum vulgare* has six rows of flowers, and that the flowers of the two middle rows never open, and are, therefore, subject exclusively to self-fertilization, while the flowers of the other four rows open slightly and disperse a portion of their pollen in the air. In *Hordeum distichum* the flowers are also in six rows, but only those of the two middle rows are perfect and fertile, while those of the other four rows are imperfect, containing stamens only. The fertile flowers never open, and are fertilized, while the spike still remains buried in its sheath. When first protruded the stigmas are already dead, thus showing the highest degree of self-fertilization. There are, however, he asserts, among these fertile flowers a very few which are destined for cross-fertilization; these remain five or more days longer unpollenized than the rest, and they open slightly, so as to allow the entry of foreign pollen, especially from the male flowers.

With respect to wheat, Delpino asserts that the idea that wheat is necessarily self-fertilized has arisen erroneously, from the fact that the flowers remain open only for a very brief time. In a wheat-field only a very small proportion, perhaps one in 400 of the flowers, are open at one and the same time. The opening of the flower of wheat is a very interesting phenomenon, and happens with wonderful rapidity. While the flowers are still closed, a motion of the glumes is observable; these separate suddenly in a moment; at the same time the anthers protrude laterally from the opening; they open and about one-third of the pollen falls inside the flower upon its own stigma, while the remaining two-thirds are dispersed into the air; the anthers are emptied in a moment, and the whole process does not occupy more than half a minute. The

stigmas remain receptive for a considerably longer period, and can then receive the pollen of other flowers.

Professor Hildebrand remarks, in conclusion, that the conditions of fertilization or pollenation must be observed in each single species, since closely allied species of the same genus show strikingly different phenomena in this respect; and moreover each separate species may exhibit very different behavior when exposed to different conditions of climate. To this end it is hoped that a series of observations on this very important and interesting subject may be forthcoming from botanists in different countries.

THE BABYLONIAN OR WEEPING WILLOW.—A writer in Silliman's Journal says that from the investigations of Karl Kock, it appears that the "Garab" upon which, according to the psalmist, the captive Jews at Babylon hung their harps, is not the weeping willow, named *Salix Babylonica* by Linnæus on account of the current tradition; and indeed is not a willow at all, but a poplar. Ranwolf had long ago concluded that the tree was not a willow. The *Salix Babylonica*, whose hardiness indicates a cooler climate than that of Mesapotamia, is now regarded as of Chinese or Japanese origin; so that its specific Linnæan name gives place to that of *Salix pendula*, Mœnch.

ROCKY MOUNTAIN OAK.—Mr. Serono Watson, in the America Naturalist for May, gives descriptions of twenty-five new plants growing in Utah and Arizona collected last year by the expeditions of Lieutenant Wheeler and of Major Powell, with the following note upon the Rocky Mountain Oak:

Quercus undulata, Torr. The common low oak of the Rocky Mountains and Wahsatch ranges southward to New Mexico and Southern Utah. An examination of considerable material shows that it is quite variable in its foliage, and includes several reputed species and forms. The typical form has oblong leaves with acute or acutish, entire, divaricate, mostly triangular lobes, the sinuses reaching half way to the midrib. This is also *Quercus Fendleri*, Lehm. With large leaves and the lobes sometimes coarsely notched, it becomes *Q. Gambelli*, Nutt., and *Q. Douglasii*, var. *Neo-Mexicana*, D. C. With the lobes more obtuse it is *Q. alba*, var. *Gunnisoni*, Torr.; and with the lobes less divaricate and more oblong, frequently notched at the apex, and the rounded or narrow sinuses reaching often nearly to the midrib, it is the more prevalent northern form, *Q. obtusiloba*, var. *depressa*, Nutt., and the var. *Utahensis*, D. C. The extreme states appear quite distinct, but intermediate forms abound, and there seems to be nothing in the flowers or fruit to distinguish them.

Fig. 6.

MICROSCOPIC OBSERVATIONS.

By Thomas Taylor.

Under date of April 25, 1873, Martin McKenzie, of Boston, Massachusetts, informed this Department that he had planted in his hothouse, on January last, a healthy Early Rose potato, and also one of the same variety affected with the fungus, *Peronospora infestans*. While growing, both were treated as nearly alike as possible, were supplied with a superabundance of water to induce fungus growth, and were subjected to about 70° of temperature. Both varieties sprouted and sent forth the usual supply of rootlets, stalks, leaves, and tubers.

The original tubers used as seed in these experiments, with their appendages, were forwarded to this Department for microscopic examination, the object being to ascertain the relative value of diseased potatoes, as compared with healthy ones, when used for seed. The so-called healthy seed-potato, with its appendages as received, was separately examined for fungoid forms, and especially for that of *Peronospora infestans*, but neither its spores, mycelium, nor fruit were found on them.

My attention was next directed to the unhealthy "seed-potato," its stalks, leaves, rootlets, and tubers. On the surface of the tubers were plainly visible, to the naked eye, small brown spots, represented by S, S, S, I, (Fig. 6,) some of which I carefully removed with a pen-knife. These I placed in strong nitric acid for several minutes. Other portions were submitted to the action of boiling caustic potash. As the mineral acids and alkalies render starch soluble and transparent, or rather transform it into new substances which are transparent and soluble, fungoid forms, if present, are more easily discovered by the use of these solvents. Potash has also the power of rendering the albuminates of the skin soluble, and by its use the fungoid masses S, S, S are more easily separated from the cellular matter of the potato. The fungoid cells are also rendered more transparent. When the brown spots S, S, S are viewed under a power of about 275 diameters, amber-colored budding cells, represented by *a*, are observed, from which protrudes amber-colored branched and jointed mycelium, as represented by 4, 5, and 6. Before examining the rootlets (see arrows) I submitted them to boiling caustic potash a few minutes, to render them soft and easily compressed, and brought into focus. 7, 8, 9, and 10 represent their mycelium and rootlets. Their relative size is represented by the scale A, C. A, A represent the parenchyma cells of the rootlets, B their vascular bundles, and C the mycelium on the rootlets. The cells *a* have the same relative size. 2 represents the vascular bundles of the tubers. The dark spots on the young tubers, 3, 3, are composed of clusters of budding spores, as represented by *a*, being of the same form and color as those of the parent tuber. The dotted lines on 1 represent the cellular structure of the skin of the tuber highly magnified.

The stalks and leaves of the unhealthy Early Rose potato, although presenting to the naked eye a healthy appearance, were found to be interspersed with amber-colored mycelium peculiar to potato-rot. The only appearance observable to the naked eye was brown spots on the new tubers, the skins of which otherwise were smooth and transparent. Their fungoid markings, to an inexperienced eye, would not readily attract attention, as they appear like small portions of brown earth.

On comparing the freshly-cut surfaces of the healthy and unhealthy tubers mentioned, the latter presented a mottled and translucent appearance, while a section of the healthy presented a more uniform color. It is clearly shown in this case that "as we sow so shall we reap."

On the 12th of April last, a healthy Early Rose potato and a New Mexican variety were planted in one of the hot-beds of the Department. Over both was placed a glass shade, the object being to produce, by artificial means, disease in their foliage. The temperature of their atmosphere ranged about 68° F. The sand in which the tubers were placed was bountifully supplied with water. In consequence of these conditions, a very moist atmosphere was kept up in the glass shade. In a few days the tubers sprouted—the Early Rose first. The foliage of both varieties gradually expanded, but it soon became evident that the leaves of the Early Rose, especially the larger ones, had become affected with what appeared to be "curl of the leaf." Upon examination it seemed that their upper surfaces expanded more rapidly than their under. The leaves of the New Mexican variety became affected similarly, but in a less degree. I examined the leaves under a power of about 90 diameters, but failed to discover any fungoid form. I next ground various portions of the respective leaves into a pulp, placing portions, thinly spread out, under a power of about 300 diameters, but failed to find fungoid cells of any kind developed or in progress. Many portions, however, of the vascular bundles seemed filled with water instead of air, a condition which is not usually found, even when leaves have been left in water for some time. The under surface of the leaves exhibited brown markings, and, when examined with a power of about 90 diameters, the color was seen to be confined to the outward boundary lines of the parenchyma cells of the leaf, showing that the cellular tissue was undergoing oxidation. Within a few hours the central parts dropped out, and the foliage became riddled with holes.

Oxidation is not always accompanied by fungus growth. While a taper is burning it is undergoing oxidation, but the conditions of change in this case render the simultaneous production of fungus cells impossible, yet, when fungus cells are undergoing the process of budding, oxidation of the cellular tissue seems to be necessarily a secondary condition. The "curl of the leaf" may not always be the result of a fungus growth, but the conditions which produce it will necessarily retard the growth of the plant commensurate to their extent, and pave the way for fungoid growths. I next put the plants into separate flower-pots, and exposed them to the influences of the open air. In a few days the foliage of both kinds attained a healthy color, but was stunted in growth. After three weeks' exposure, under favorable conditions as to heat and moisture, the foliage of both appeared healthy.

On June 9, the New Mexican plant put forth flower-buds; while the other, although known to be an early variety, did not exhibit any. While both plants were passing from their unhealthy condition in the open air, many of the leaves of the Early Rose plant wilted and died; the leaves of the other remained a healthy green throughout, showing a superior vigor.

On the 19th of May last, three varieties of New Mexican potatoes were planted in the Department grounds for experimental purposes, and notwithstanding the extreme dryness of the atmosphere during the last thirty days their growth has proved highly vigorous. The stalks are numerous and from 10 to 12 inches in height. The foliage is abundant, has a very healthy appearance, is highly wrinkled, of a dark green color,

and is remarkably free from insect injuries. At this date (June 13th) their buds are forming.

Judging from present appearances, any of the three varieties would prove highly valuable for localities subject to a hot and dry atmosphere.

The New Mexican potatoes, although not so mealy as the New York Peach-blows, white and red, are dry and of good flavor. Their cultivation in the northern States will doubtless modify the structural and chemical properties. At present they seem wholly free from the fungus of potato-rot. In order to test their anti-fungoid properties more fully, samples have been forwarded to experienced farmers in the State of Massachusetts, and other States, to be planted with other varieties known to be very liable to potato-disease. Any practical results derived from experiments now in progress will be given in a future article.

DETERIORATION OF AMERICAN COTTON.

By the Commissioner.

The production, sale, and consumption of cotton are subjects of so much interest, that everything pertaining thereto should be well understood. Planters, as well as merchants and manufacturers, may profit by lessons elicited by a comparison of the experiences and observations of those engaged in its cultivation, marketing, and manufacture. The correspondence of this Department with intelligent planters of the South made the impression that the quality of cotton offered in our markets had greatly deteriorated within the last twelve years, and thus induced me to prepare the following circular, requesting cotton-growers of the South and manufacturers of the East to furnish the results of their observations on the subject:

To ——— ———:

Questions of some importance to the country have arisen, which it is desirable should be solved by the opinions of manufacturers as well as planters. 1. Has the staple of American cotton deteriorated in quality within the last twelve years. If so, (2,) to what cause is it attributable?

It has been suggested that deterioration is traceable to certain phases of the cotton market, which induce planters to study quantity rather than quality; that dealers do not judiciously discriminate between qualities in fixing the price.

To aid this Department in the investigation of the subject for the benefit of manufacturers and planters, I will be obliged to you for your opinions, predicated upon your experience and observation of the subject.

I am, most respectfully, your obedient servant,

FREDK. WATTS,
Commissioner of Agriculture.

This circular was directed to fifty manufacturers of the Eastern States, and to as many planters of the Southern States; and from very many of both classes answers were received, satisfactorily showing that while the quality of cotton now brought to market is quite inferior in condition to what was produced twelve years ago, that condition is attributable to causes which do not *necessarily* enter into the production or sale of the commodity.

It seems to be very clear that the present production is, in a large measure, in the hands and under the direction of a less intelligent class of planters, who do not appreciate the importance of a judicious selection of seed, proper cultivation, and especially a careful preparation for the market. Now, while there are other planters, who are intelligently

guided in these requisites, the productions of both classes meet in the same market, and should command a discrimination as to quality and price, which, it is complained, they do not get. On the contrary, the conclusion is that dirty cotton is most profitable, because it brings more money per acre than that which is sold by the careful planter.

This seems to be an evil which time and circumstances must cure; and it is therefore an injudicious conclusion, that it would be better to adopt the example of the planter who sells dirty cotton. It cannot be that the merchant or manufacturer will long fail to discriminate between the good and the bad, when they are marked by such distinctive qualities as clean and dirty. This, then, may be looked upon as a temporary evil. And we may hope that its cure will necessarily work a corresponding change in the careless class of planters to which we have alluded; for if they have to pay for hauling dirt, for which they get no price, and which decreases the value and price of their cotton, their losses will teach them to separate the former from the latter. It is assuming too much to suppose that both the merchant and the manufacturer will continue insensible to the advantages which arise from a choice between good and bad. The evil complained of may last for a time; but detection and change are certain.

We cannot doubt for a moment that the spirit of improvement in agriculture actuates the planters of the South as well as the farmers of the North; and that the fact that better seed will produce better products, is greatly appreciated and acted upon everywhere. But if the merchant and manufacturer fail to appreciate the value of a good article of produce, as compared with an inferior one, it will go very far to discourage the effort to excel.

All the information which I have been enabled to gather on this subject leads to the conclusion that there is no deterioration in the cotton staple, but that efforts to improve its cultivation and quality are, in some degree, thwarted by a want of proper discrimination in the market prices between the qualities offered for sale.

AUSTRALIAN WOOLS.

In the monthly report of the Department of Agriculture for July, 1872, mention was made of the reception and deposit in the museum of the Department of thirty-three prize fleeces of Australian wools, forwarded by the Agricultural Society of New South Wales, with a view, as stated by the secretary, Mr. Joubert, of enabling buyers of wool and breeders of sheep in the United States to see what was produced in Australia, and of bringing about such an exchange of blood in sheep as might be of mutual benefit to the two countries. These wools were duly placed on exhibition in the museum, where they now remain; samples were likewise sent to a number of wool-growers' associations in the western and northern States for inspection, and for the purpose of eliciting the opinions of those presumed to be competent judges in the matter. As the Department, however, had no means of establishing such a system of exchange of animals as was suggested, it could only refer the proposition to individuals and associations for their action. Among those to whom reference was thus made was Hon. Henry S. Randall, president of the National Wool-Growers' Association, whose opinion was freely expressed in a letter to the Department, which was

published in full in the monthly report above referred to. This opinion was adverse to the contemplated exchange, for the reason that no benefit to our wool interests could reasonably be expected from the introduction of Australian merinos into this country. The only State wool-growers' associations from which the Department has received a report upon the merits of the wools which were sent to them, are those of Pennsylvania and Ohio. The latter, after having submitted the samples to the examination of a committee of ten good judges of wool, passed a resolution that, in their opinion, "the fine-wool flocks of Ohio could not be benefited by introducing a cross of blood from the fine-wool flocks of New South Wales." The Pennsylvania association also submitted the Australian samples to a competent and judicious committee, whose report is given below in full. In communicating this report to the Department, the president of the association, F. Julius Le Moyne, esq., remarks that "wool-growers in the United States are not in the habit of preparing their wool for market as these Australian samples were evidently prepared—most of them having been partially scoured, soap and chemicals being used in the operation; while American wools are generally sold either in the grease or brook-washed. In view of the fact that this difference of preparation renders a comparison of foreign with American wools more difficult and uncertain, Mr. Le Moyne suggests that "a uniform manner of preparing our wools for the market is very desirable, and would save much trouble in the traffic, and give character and stability to the business."

REPORT OF THE COMMITTEE ON SAMPLES OF AUSTRALIAN WOOL.

To Dr. F. J. Le Moyne, president of The State of Pennsylvania Wool-Growers' Association:

The undersigned committee, to whom you assigned for examination samples of Australian wool received by you from the Commissioner of the Department of Agriculture at Washington City, D. C., respectfully report:

Those of the thirty-three samples offered to our inspection which have been partially scoured are much better cleansed than is customary in our State, are in very nice condition, and compare very favorably with the wools of the same class in Pennsylvania.

The scale of comparative qualities, as given in the small pamphlet accompanying the samples, (if we rightly understand it,) affords a method, if skillfully and honestly administered, of arriving at the comparative merits of fleeces of different sheep, and of varieties of breed. No such standards have been adopted in this State. The relative and comparative points are well presented in this pamphlet, embracing all the samples of wool presented for inspection.

After a careful examination, we have selected as XXX, (triple X) or pick-lock, in our mode of grading, the samples Nos. 1, 6, 8, 11, 12, and 32; and, with the exception of 32, the others are too light in fleece, falling nearly a pound in weight below the customary weight of premium fleeces in our standard flocks in the State of the same grade of wool, viz., XXX. We calculate on two and a half to three pounds of clean wool of this grade, while, with the exception of No. 32, these Australian wools fall short of that weight nearly or quite one pound to the fleece.

With repect to the samples Nos. 3, 4, 5, 7, 9, 10, 15, and 16, also Nos. 20, 21, 23, 24, 27, 29, and 30, second quality, some of which might be graded somewhat above our XX (double X) when compared with the fleeces of our "improved American merino," which produce XX wool, we are safe in saying large selections can be made from the standard flocks in our State, either clean or in the grease, which would greatly excel these Australian samples in nearly every point of comparison.

The remaining samples we would class with our single X wools, most of which would fall below the products of our American merino fleeces of that grade, more especially in weight.

Sample No. 31, French merino, is, in our opinion, the poorest in the lot. After a short experiment with this breed of sheep in this State, we abandoned them quickly, as unworthy of propagation. Their fiber is very deficient in strength, and their fleeces too light in proportion to their heavy carcasses.

The weight of the carcasses from which these Australian fleeces were shown not being given, one essential point of merit and comparison was not afforded us.

We present, from our own observation, for the consideration of those interested, the general product from ewes in the good flocks of our State, the weight of clean fleeces, and their percentage to the weight of the animal:

American Saxon merino, 65 pounds carcass, 3 pounds triple X wool, 4⅝ per cent. wool.
American improved Spanish, 65 pounds carcass, 4 pounds double X wool, 6⅛ per cent. wool.
American improved Spanish, 65 pounds carcass, 4½ pounds single X wool, 6⅞ per cent. wool.

After a minute and fair examination of these Australian wools, we cannot see that our Pennsylvania flocks would be benefited by crossing with the breeds which these samples represent.

The Silesian breed of sheep is larger than that of the Saxon merino, and would change but little the above percentage of triple X wool, while the Paular breed is less in size than that of the American improved Spanish; and their percentage of wool, of both double X and single X, would also be nearly the same.

There are various other breeds of sheep in the State, kept more for mutton than wool. Among these the Leicester stands highest. Their wool is long and beautiful, and is used for combing purposes. We deem it unnecessary to mention anything further of other varieties of breed.

Some samples accompany this report.

Respectfully submitted.

JOHN McDOWELL,
M. H. EWING,
JAMES G. STREAN,
WM. DAVIS,
W. LEE ARCHER,
Committee.

Mr. Le Moyne has forwarded to the Department a very fine collection of samples of wool, grown in Pennsylvania, which have been in the museum of the Department for exhibition.

Mr. Joubert, in a letter to the Department, took exception to Mr. Randall's remarks, suggesting that his opinions had been formed from erroneous impressions derived from specimens which had been brought from Australia, "under false pretenses," and intimating that he should like to have Mr. Randall's opinion of the fleeces sent to the Department. And in a subsequent letter to the Department, Mr. Joubert repeats his objections to the views expressed by Mr. Randall, and incloses an extract from the Sydney Herald, commenting, with some severity, upon Mr. Randall's views of the comparative merits of the fine wools of this country and Australia, and repeating the suggestion of Mr. Joubert that his opinion of Australian wools had been formed from "worthless culls" that had been shipped to the United States from New Zealand under false pretenses. In this connection the following communication from Mr. Randall, written after a careful examination and analysis of the samples of Australian wools forwarded by Mr. Joubert, will be read with interest by the buyers of sheep and the wool-growers of this country:

CORTLAND VILLAGE, NEW YORK, *May* 15, 1873.

SIR: I have received yours containing the letters addressed to you by Mr. Jules Joubert, secretary of the Agricultural Society of New South Wales, commenting on the opinion which I expressed, in answer to your inquiries, in regard to the expediency of introducing Australian merinos into our country by the system of exchanges proposed by Mr. Joubert. I wrote you:

"In regard to fine-wool sheep, apparently the most favorable subjects of exchange, the standards of breeding in the two countries are essentially different. A friend of mine brought out from Australia some merinos, six or eight, and placed them with me. They were from the most celebrated flocks, and were mostly first-prize sheep at the Australian International Colonial Show.* They were of good size and form, and were very hardy and vigorous. Their wool was much finer than ours, and more than proportionably lighter. Compared with ours they were a thin-wooled sheep. Their fleeces would not sell for enough more per pound than American merino fleeces to be as profitable as the latter."

Here everything that could be asked for was conceded to these Australian sheep, except in regard to their relative weight of fleeces. Because I declared them inferior to American merinos in that respect, Mr. Joubert assumes that they were "miserable specimens"

* By my own mistake, or that of the printer, this designation is improperly given. For "International Colonial Show" read "Inter-colonial Show."

of the breed brought "to the United States under false colors." I will pass this charge for the present, and let Mr. Joubert himself show the weights of fleeces of the most approved Australian merinos. Acting for the agricultural society he represents, this gentleman forwarded to the United States thirty-three merino fleeces which had received prizes at the exhibition at Sydney in 1871, "*in order*," he stated, "*to enable not only the buyers of wool, but also the breeders of sheep, to see what we produce; and with a view to bring about an exchange which must necessarily prove of mutual benefit.*" You, Mr. Commissioner of Agriculture, sent me ample samples of these specimen fleeces, accompanied by a descriptive catalogue giving average weight of each fleece in the lot from which it was taken, its time of growth, age of sheep, how bred, &c. Some of the fleeces were washed and some not. The relative weight of wool in the latter condition cannot, of course, be determined.

Of the fleeces sent by Mr. Joubert which were washed and time of growth given, there were sixteen from ewes and three from rams. The following facts appear in relation to the three heaviest ewes' fleeces:

	Weight of fleeces.	*Days' growth.*	*Age of sheep.*
Ewe	4 lbs. 4⅜ oz.	392.	4 years and upward.
Ewe	4 lbs. 1½ oz.	380.	2 years and upward.
Ewe	4 lbs. 0⅜ oz.	372.	4 years and upward.

The eight next heaviest fleeces weighed from 3 pounds 2⅛ ounces to 3 pounds 13⅛ ounces. Another fleece weighed 2 pounds 0⅜ ounces; and the remaining four, from 1 pound 5¼ ounces to 1 pound 9 ounces.

The following appears in relation to the three rams' fleeces:

	Weight of fleeces.	*Days' growth.*	*Age of sheep.*
Ram	5 lbs. 1½ oz.	371.	2 to 4 years.
Ram	4 lbs. 3½ oz.	13½ months.	13½ months.
Ram	3 lbs. 13½ oz.	13 months.	13 months.

The answers to the question "how bred," show that the thiry-three specimen sheep belonged to no distinct and established variety or family, known as "Australian merinos," but embraced numerous other varieties and crosses between those varieties. Thus but two are given as Australian merinos, and three as crosses between them and other varieties. Eight are given as Saxons, and they, too, have several crosses. Others are denominated "pure merinos;" "home-bred;" "colonial-bred;" "station-bred;" "originally from imported Negretti ram;" "principally from German blood;" "from merino rams for upward of twenty years;" "from pure-bred merino ewes out of imported Rambouillet stock;" "from French merino rams for upward of twenty years," &c.

Prime ewes of the improved heavy-fleeced stock known among the breeders of them as full-blood American merinos, annually produce about six pounds of washed wool per head. In breeders' ("ram-sellers") flocks, in which a rigid selection in regard to quantity of wool is practiced, such average weight sometimes reaches from seven to eight pounds' weight. It is difficult to say how much washed wool rams of corresponding quality generally produce, as the heavier-fleeced stock-rams are almost universally shorn unwashed; but their fleeces have in numerous instances been *scoured* separately, by wool-manufacturers, and have yielded from six to eight pounds, and in one instance upwards of nine pounds of *scoured* wool. The material difference in the reduction of weight made by scouring and mere washing is understood by all.

And now let us compare the relative market value, in this country, of different grades of merino wool. From 1827 to 1861, inclusive, a period of thirty-five years, the average prices of wool each quarter of the year, in Boston, one of the two leading wool-markets of the United States, was for *fine*, 50$\frac{4}{10}$ cents, and for *medium*, 42$\frac{8}{10}$ cents per pound; the former averaging but 15 per centum higher than the latter; and this average difference has decreased instead of increasing during the period which has since elapsed. The wools classed as fine "included Saxon, grade Saxon, and choice lightish-fleece American merino; the medium included American merino and grade down, say to half-blood."* The first

* The table of relative prices above referred to (and it also included coarse wools) was prepared at my request by George Livermore, esq., an eminent wool-merchant and statistician of Boston, who compiled it from his own books and those of his predecessors in the firm. I published it in "Fine-Wool Husbandry," and subsequently in "The Practical Shepherd;" and it has been repeatedly published elsewhere, without its accuracy ever having been called in question. The above classification or specification, by blood, of the sheep producing, respectively, the wool designated as "fine" and "medium," was given by me in both the above-named works, and equally, I believe, without challenge.

about corresponded with Australian fine wools. The heavy American merino wool all falls into the second or medium class; but the grower of it, with only 15 per cent. against him in average selling price, and with more than 100 per cent. in his favor, according to Mr. Joubert's showing, in average weight of fleece,* will, it is obvious, find the production of his heavy wools far the most profitable. Indeed, in our principal older wool-growing northern and eastern States, where the sheep-lands are generally worth at least $30 or $40 an acre, where the sheep require a full supply of artificial feed during at least five months of the year, fleeces of the weight of those sent by Mr. Joubert, no matter how high their quality, would not pay the actual cost of growing them. This fact has been fully established by experience. Many Saxon sheep of like type were imported into this country between 1824 and 1828, and various choice lots of them and other light-fleeced merino stocks have been introduced since. But at length sheep of this stamp have been almost wholly discarded by American wool-growers. Even our "Washington County wools,"† formerly rivaling the Australian wools in fineness and excelling them in soundness and in uniformity, have, after a long struggle, mostly given way to heavier fleeces produced by a cross with heavier-wooled stocks. The opening of cheap lands and perennial pasturage to sheep-husbandry in some of our new States, and future circumstances more propitious than existing ones to the extension of our fine-wool manufactures, may ultimately render the growing of fine merino wools profitable; but the attainment of this highly desirable result depends upon so many contingencies, and is liable to be so long delayed, that it would be the height of folly in our breeders to take preparatory steps in that direction at present.

While the foregoing facts show, beyond all question, that the American is the most profitable merino for the United States, it is not by any means claimed that they show it would be the most profitable variety for Australia. The circumstances which regulate the wool-markets of the two countries are essentially different. Our wools are grown exclusively to meet the demand of a home market, where both the consumption and the manufacture of medium merino wools are vastly in excess of the consumption and manufacture of fine wools. Australia grows wool entirely for export. She undoubtedly finds a larger and more remunerative market for fine wools, or her intelligent and experienced growers would not continue to give their production the preference. Every practical breeder knows that the maximum of weight and the maximum of fineness in wool cannot be attained, or even approximately attained, in the same fleeces; and hence to say, as I did, of the Australian merinos, that, "compared with ours, they were a thin-wooled sheep," coupled with the declaration that "their wool was much finer than ours," was no real or intended disparagement of them.

Here I would choose to close this letter, but justice to the gentleman who imported the Australian sheep described by me compels me to notice the imputations made on him in Mr. Joubert's letter to you, and by a writer in the Sydney Morning Herald, whose article Mr. Joubert forwarded. The history of that importation is briefly as follows: Mr. Charles J. Kenworthy, an American medical gentleman who had resided a number of years in Australia, wrote me from Ballarat, Victoria, early in 1864, that he was about to return to the United States, and should bring with him some Australian merinos. He was sanguine that, with their previous habits, these sheep could subsist in great numbers, and all the year round, on the "piny barrens of the Southern States," and thus utilize, with great profits, an immense region then and now entirely unproductive and almost totally valueless; and he was determined to commence the experiment on a small scale. On his arrival in this country he, by my permission, brought the sheep to my farm until he could make other arrangements. He informed me that he obtained them in Victoria from Thomas Learmonth, J. L. Currie, and T. Shaw, jr., breeders of high standing in that province, winners of prizes on sheep at the Melbourne exhibitions, and (in 1865) on wool exhibited at Melbourne, and London, England. Dr. Kenworthy showed me letters from two at least of the above gentlemen, couched rather in the language of friendly regard than of business, mentioning the sheep they had carefully selected for him, declining any compensation for them, and expressing kindly wishes for the success of his "experiment." The doctor's return was during the din of civil war and when the pine-barrens of the South were no places to try experiments in sheep-husbandry. Subsequently, for reasons which do not require explanation here, he gave up the undertaking. He never sold or offered for sale one of the sheep, never called or desired me to call public attention to them. And, before dropping the subject, I will add that I have no doubt they were very choice specimens of Australian-bred merinos. The imported ewes annually sheared from 3½

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* Wool is usually washed cleaner for market in Australia than in the United States, but the difference is not sufficient materially to affect the above estimate.

† They took their name from Washington County, Pennsylvania, and were grown in the southwest counties of that State, the Pan-Handle of West Virginia, and the adjacent portions of Ohio.

pounds to 4 pounds of washed wool per head; the imported ram about 5½ pounds; and among the numerous choice specimens of wool, including Mr. Joubert's, from noted Australian flocks, which I have seen within the last ten or fifteen years, I have seen none, in my opinion, of superior quality from fleeces of equal weight.

I am, sir, very truly, yours,

HENRY S. RANDALL.

Hon. FREDERICK WATTS,
Commissioner of Agriculture.

EUROPEAN STATISTICS.

STATISTICS OF AGRICULTURE IN SWEDEN AND NORWAY.

The following facts relating to agriculture and commerce in Sweden and Norway are condensed from communications made to the Department of State by Mr. C. C. Andrews, United States minister to Sweden, chiefly from official reports:

AGRICULTURE IN SWEDEN.—The surface of Sweden, as a whole, slopes gradually from the Baltic to the mountain range which separates it from Norway. The larger part is what is called low ground, which is intersected by numerous granite ridges from 40 to 50 feet high. It abounds in lakes, streams, and forests. Of the latter some are of massive fir, some of stately oak and other hard-wood varieties, and some on rocky tracts are of scanty growth. By the co-operation of the government and private enterprise, Sweden has developed a well-organized agricultural system. The Royal Academy of Agriculture, established at Stockholm, has connected with it an experimental farm, and devotes itself chiefly to the solving of scientific questions involved in agricultural industries. There are two agricultural institutes of a high grade—Alnarp, near Luna, and Ultuna, near Upsala—which have fine farms and are well endowed. A few graduates from these are sent annually, at the public expense, to spend a year in studying the theory and practice of agriculture in Scotland, it being thought that Scotland, in its agricultural features, resembles Sweden more than any other country does. In addition to these three institutions, national in their scope, each län, or county, has an agricultural economic society, of which the county governor (appointed by the Crown) is usually president. These county societies draw a considerable revenue from a brandy-tax imposed by the government, and hence, though voluntary organizations, they are indirectly brought under obligations to collect statistics for governmental purposes. They have the means of distributing premiums, and as they generally include the most intelligent and public-spirited men in the county, they promote agricultural interests in many ways. Statistical blanks are annually forwarded by the central bureau of statistics to each of these societies, which is expected to see that they are filled out and returned by all the farmers within its limits. In this work the society is assisted by the parish administrations, and such other agencies as are available. As soon as the returns from any one county are received by the statistical bureau, they are printed and distributed over the kingdom. But, though it often happens that the statistics of a county are returned in printed form and distributed through it (and the country) within six weeks from the time they were forwarded, the annual report of agriculture for the whole kingdom is seldom published before the statistics are two years old.

In Sweden much of the land has never been surveyed, and therefore the following statistics are, in some respects, but an approximation to exactness. The report of 1868 gives as the whole area, main-land and islands, 97,051,107 imperial acres. Of this there were in vegetable, hop, and market gardens, 52,684 acres; arable and other land under cultivation, 6,023,448; natural meadows, 4,910,296; forest-bearing land, 49,784,515; mineral and waste lands, 36,280,164. For the three years preceding 1868 the amount of land under cultivation was annually increased, on the average, about 2.25 per cent. The increase in acreage of improved and cultivated land, in 1865, was as follows: Newly cultivated land, 28,661 acres; drained, 10,676; underdrained, 34,725; irrigated, 3,245; marled, 32,678; forest-sowed, 6,008; forest-planted, 2,458; total, 118,451 acres. In 1869 the area in wheat and rye was 951,600 acres; in barley and oats, 1,830,000; buckwheat, 1,220. The product of wheat was 2,200,000 imperial bushels; rye, 14,400,000; barley, 10,400,000; oats, 26,400,000; buckwheat, 20,000; pease and beans, 1,600,000; potatoes, 40,000,000. The exports of cereals were: Wheat and flour, 455,080 imperial bushels; rye, 31,560; barley and malt, 906,160; oats, 7,114,896. The imports of cereals were: Wheat and flour, 900,040 imperial bushels; rye flour or meal, 3,571,692; barley and malt, 227,360.

Farms and their occupants.—In 1868 the number of farmers owning farms of 5 acres or less was 63,181; of over 5 to 50 acres, 153,379; of over 50 to 250 acres, 22,744; of over 250 acres, 2,588; total number of owners, 241,892. The number of tenants and proprietors cultivating farms of 5 acres or less was 91,858; of over 5 to 50 acres, 98,665; of over 50 to 250 acres, 13,390; of over 250 acres, 1,648; total number of tenants and proprietors cultivating farms, 205,561. Of farms which maintain entirely the family cultivating them, the smallest consist of about 40 acres of arable and meadow land, with 50 to 100 acres of pasture and wood land. The occupants of smaller farms generally support their families, in part, from other resources than farming. The class known in Sweden as "the peasantry" own the land they cultivate. There is a large class called "torpars," (that is, cottagers,) who occupy "torps" and pay the rent in labor. A torp usually includes, beside a a cottage, not over 4 acres of arable land, with the right of fuel and of pasture for a number of cattle. The rent varies from one to three days' work per week, to which must be added a certain number of days' work in harvest by women; for, in Sweden, women work on the farm in planting, hoeing, and harvesting. In 1867 the number of torps in the kingdom was 179,034. The average money-rent of land of medium quality is, for small farms, about $4.25 per tunnland, a tunnland being 1.22 imperial acres; for large farms, $2.50 to $3.25 per tunnland. Leases are usually for ten years, but the Crown-lands may be leased for twenty years.

Wages.—Money-wages vary according to season and locality. In winter, for men working nine hours per day, day-wages range from 16 to 27 cents; in summer, for men working thirteen hours per day, they range from 21 to 41 cents; for women, in summer, day-wages are from 10 to 22 cents. Yearly wages, including board, are, for men, from $20 to $30; for girls, from $10 to $14. The value of a year's board for a hired man is estimated at from $45 to $70. Of late years land has been increasing in value, and, as it does so, the torpar system is found less economical; hence there is a growing practice of employing married laborers who reside on the farm and are paid partly in money and partly in farm products. Generally married hired laborers have a cottage and a plat of land rent free.

Improvement in draining.—Drainage is made a specialty in Sweden, and it is estimated that the increase in value of land thus improved has already added over $100,000,000 to the permanent wealth of the kingdom. Any farmer who wishes to drain land can have the services of a skillful engineer, at small expense, by applying through the proper official channel. The incomplete statistics of 1867 returned for that year 9,756 acres of overflowed land as drained, and 11,744 acres of other land as underdrained. In the same line of improvement, subsoil plows, plowing to the depth of 12 or 15 inches, are being introduced, and the use of them promises to soon become general.

Fertilizers.—The use of guano and Chilian saltpeter has almost ceased in Sweden; the use of phosphates is increasing—applied mostly to root-crops and rye; seldom to grass. Beside the importation of artificial fertilizers in considerable quantities, there are in the country numerous establishments for manufacturing them.

Variety of products.—In the northern provinces, next to grass, barley and potatoes are the principal crops; rye, oats, and turnips are raised on a smaller scale. Fruit will not ripen. In the central provinces, in addition to the above-named products, wheat, peas, vetches, and beets are produced, and apples, pears, plums, and cherries ripen. The southern provinces and islands enlarge the catalogue still further by adding to it rape, carrots, walnuts, and grapes.

Rotation of crops.—In the northern provinces it is still the prevailing practice to raise grain on the same soil every year. A two-course system—bare fallow on one-half the arable land, and grain or (to a less extent) root-crops on the other half—is in use in the provinces around Lake Mälar. A three-course system—one-third of the arable land in fallow, one-third in wheat and rye, and one-third in spring-crops—prevails in the southern provinces. But throughout the country the laws by which rotation in crops should be governed are becoming better understood, and changes in favor of conformity to them are gradually taking place. In the southern portions there is now in practice a six to ten years' course. It is modified more or less by the varying nature of the soil and the varying judgments and tastes of individual farmers, but the following are specimens. On a mild clay soil: first year, fallow; second, wheat or rye; third, fourth, and fifth, clover and grass; sixth, oats; seventh, potatoes; eighth, barley; ninth, clover or vetches for green fodder; tenth, wheat. On a stiffer clay soil: first year, fallow; second, rye; third, clover; fourth, wheat; fifth, vetches or peas; sixth, barley; seventh, oats. On light land: first year, fallow; second, rye; third, roots; fourth, barley; fifth and sixth, grass; seventh, oats. On sandy soil: first year, root crop; second, barley or oats; third and fourth, white clover or grass for pasture; fifth, rye.

Yield.—The yield per tunnland (1.22 acres) averages: wheat and rape, each 40 bushels, and 4,000 pounds of straw; rye, 40 bushels, and 5,000 pounds of straw; barley, 40 bushels, and 2,500 pounds of straw; peas, 30 bushels, and 2,000 pounds of straw; vetches, 40 bushels, and 3,000 pounds of straw; oats, 50 bushels, and 3,000 pounds of straw; beans, 50 bushels, and 2,000 pounds of straw; potatoes, 500 bushels; turnips, 1,000 bushels; beets, 750 bushels; white clover, 3,000 pounds of hay; red clover, Swedish clover, and timothy, each 6,000 pounds of hay.

COMMERCE BETWEEN THE UNITED STATES AND SWEDEN.

The following tables will show the variations of commerce between the United States and Sweden during the years indicated. A Swedish skalpund is a small fraction less than a pound avordupois, 1.067 skalpunds being equal to 1 pound: and a Swedish centner equals 100 skalpunds, or 93.7 pounds.

Imports into Sweden from the United States.

Articles.	1865.	1866.	1867.	1868.	1869.
Cotton.....skalpunds..	.....	350,000	319,131	553,270	.....
Dye-wood.....centners..	642	8,036	2,100	.....	.....
Coffee.....skalpunds..	329,080	353	490	.....	687,580
Mineral oil, raw.....do....	.....	1,004,605	441,750	.....	642,275
Mineral oil, rectified.....do....	57,970	346,313	425,380	1,161,727	2,236,901
Tobacco leaves.....do....	320,035	78,907	161,984	199,626	41,551
Tobacco stalks.....do....	156,554	117,767	13,055	9,007	22,545
White lead.....do....	.....	.....	.....	.....	1,710

Exports from Sweden to the United States.

Bar-iron.....centners..	141,375	340,815	554,088	432,578	529,907
Bolt, tool, and rod iron.....do....	.....	5,592	3,832	2,777	5,223

In 1869 there were also exported to the United States 2,524 centners of cast-steel; 1,198 centners of iron plates; 13,933 centners of scrap iron; 38,528 centners of manufactured iron; also some small lots of lumber.

The total value of exports from Sweden to the United States, in 1869, was $14,630,000—greater than in any previous year except 1867. But while exports to the United States were increasing, with a fair prospect of continuing to do so, exports to Sweden from this country were diminishing; the value of goods imported from the United States in 1860 was $24,631,600, and in 1861 it was nearly the same; but in 1869 it had fallen to $2,120,400. The import of cotton from the United States was wholly superseded in 1869, and principally by imports from London of cotton the main part of which was not produced in this country. It will be seen, from the above table, that the import of tobacco leaves and stalks from the United States was also gradually diminishing; but the import of petroleum produced here was somewhat rapidly increasing.

AGRICULTURE IN NORWAY.—The area under cereals, and the product of cereals and potatoes in Norway, for the years 1865 and 1870, were:

	1865.	1870.
Wheat.....acres..	43,750	*45,000
Barley and oats.....do....	360,250	375,000
Mixed grain.....do....	48,750	50,000
Wheat.....imperial bushels..	271,384	*40,000
Rye.....do....	651,390	764,000
Barley.....do....	3,415,546	3,820,000
Oats.....do....	7,881,359	8,404,000
Pease and beans.....do....	186,561	289,200
Barley and oats, (half and half).....do....	1,741,213	1,910,000
Potatoes.....do....	18,035,358	21,010,000

*Estimated.

The principal exports and imports of cereals, for the years 1866 to 1870, inclusive, were:

EXPORTS.

	1866.	1867.	1868.	1869.	1870.
Oats ..... bushels.	279,795	499,090	161,543	180,338	3,056,000
Barley and malt.do..	145	672	2,320	1,149	.....

IMPORTS.

Wheat .... bushels..	148,054	142,539	154,889	155,626	152,800
Flour.....do....	85,002	72,767	93,768	105,160	114,600
Rye .....do....	3,533,717	2,736,648	375,211	3,975,997	4,202,000
Rye-flour and meal .... bushels..	374,405	330,506	359,316	318,614	382,000
Barley and malt.do..	1,763,873	1,537,083	2,317,842	2,214,877	2,101,000

The value of the principal imports into Norway, in 1869, was as follows: Animal food, 1,050,000 specie dollars; cereals, $7,384,000; coffee, $1,203,000; sugar, sirup, and honey, $1,119,000; brandies and spirits, $280,000; tobacco, $529,000; dry-goods, $2,616,000; hides and skins, $518,000; coal, $749,000; salt, $577,000. The value of the principal exports for the same year: fish, (dried, klip, fresh herrings, &c.,) 7,155,000 specie dollars; skins and spawn, $855,000; cod-liver oil, $1,183,000; lumber, $6,629,000; ice, $105,000; sulphurous ores, $232,000; metals, $293,000; oats, $94,000.

The commerce of Norway with the United States appears to be on the increase. In 1868 the number of Norwegian vessels arriving in the harbors of the United States was 170, of which the aggregate tonnage was 71,576; in 1869 the number was 372, and the tonnage 148,126. In the former year the number of Norwegian vessels departing from harbors of the United States was 180, of 74,428 tons; in the latter year, 347, of 139,415 tons.

GERMAN EXPORTS TO THE UNITED STATES.

The statements below, relating to the commerce of this country with certain districts in the German Empire, are gathered from reports made to the Department of State by Mr. R. S. Kendall, United States consul at Strasburg, and by Mr. E. Klamprecht, United States consul at Stuttgart:

EXPORTS FROM STRASBURG AND MÜLHAUSEN—There was, in 1871, a very large increase of exports to the United States from the consular district of Strasburg and Mülhausen, and that notwithstanding the great drawback to its manufactures, occasioned by siege and other ravages of war. But it is not probable that there was any real increase in the importation of articles manufactured in the district into the United States. Previous to the Franco-Prussian war large quantities of goods manufactured in Strasburg and its vicinity were exported to this country from Paris or some other commercial center in Western France. Many mercantile houses in Paris were connected with manufacturing establishments at Strasburg, from which they first transported manufactures to Paris, and then exported them to the United States simply as French

products. But during the war all goods manufactured at and near Strasburg, and destined for this country, had to be exported directly. Silk head-nets, which stand third in amount of value on the list of exports from that district to the United States in 1871, have always been manufactured almost exclusively in Alsace; and yet there had been no direct export of them to this country previous to January, 1871, but they had been conveyed in bulk from the place of production to Paris, where they were assorted, put up in fancy boxes, and thence shipped. The same was true in part with respect to most, if not all, articles produced in Alsace-Lorain and imported into the United States. Since the restoration of order and the re-opening of old avenues of transportation through France, direct exports from Strasburg to the United States are again diminishing, and may yet settle down to what they were before the war, though it is not yet safe to predict what effect the cession of that territory to Prussia is to have upon its manufacturing and commercial interests and relations. Many of its manufacturers, because of old business connections or of political preference, seem now disposed to transfer their business to French territory.

The following table exhibits the several kinds and values of exports from the consular district of Strasburg and Müllhausen to the United States for the year ending September 30, 1871:

Articles.	Value, francs.	Articles.	Value, francs.
From Strasburg.		Books	825. 80
Leather	2, 645, 800. 70	Dye-drugs	961. 75
Silk head-nets	786, 139. 85	Sundries	2, 032. 30
Glassware	532, 522. 50	Total	5, 270, 900. 35
Cotton and woolen goods	524, 873. 76		
Gloves	224, 162. 50	*From Müllhausen.*	
Plush	193, 150. 80		
Garancine	81, 673. 40	Printed tissues	1, 651. 897. 40
Satins and velvets	75, 106. 75	Cotton and woolen goods	652, 753. 00
Watch-glasses	58, 227. 80	Silk ribbons	445, 282. 90
Silk ribbons	54, 986. 80	Chemical products	106, 601. 40
Muslin	22, 914. 90	Paper-hangings	47, 760 35
Wine	21, 053. 70	Cotton twist	22, 811. 60
Effervescing powder	10, 325. 90	Photographic materials	20, 570. 00
Cloth	8, 955. 05	Cotton tissue	13, 880. 45
Morocco leather	6, 562. 60	Machinery	10, 410. 00
Vinegar	4, 738. 00	Silk tissue	68, 118. 40
Goose-livers	3, 340. 00	Sundries	7, 870. 50
Watch-springs	2, 488. 00		
Hardware	2, 291. 70	Total	3, 047, 956. 00
Watch-keys	2, 223. 60	Total from Strasburg added	5, 270, 900. 35
Varnish	2, 108. 26		
Brandy	1, 934. 50	Total for the district	8, 318, 856. 35
Handkerchiefs	1, 500. 00		

EXPORTS FROM THE KINGDOM OF WÜRTEMBERG.—For the year ending September 30, 1871, the exports to the United States from the consular district of Stuttgart, Würtemberg, were as follows:

Articles.	Value in florins and kreutzers.	Articles.	Value in florins and kreutzers.
	Fl. Kr.		*Fl. Kr.*
Corsets	2, 589, 333 30	Dried fruit	199, 174 31
Wine	101, 429 22	Jewelry	72, 290 54
Drugs	34, 181 15	Metal ware	8, 316 44½
Cotton goods	91, 119 21	Toys	3, 042 40
Woolen goods	5, 622 15	Colors	157, 259 24½
Linen goods	1, 528 28	Sundries	184, 922 21
Mixed goods	6, 193 22		
Books	28, 373 35	Total value	3, 775, 226 24
Leather	292, 438 41		

A florin is about 40 cents, and a kreutzer two-thirds of one cent, or one-sixtieth of a florin. These exports to the United States exceed in value those of any previous year. The several values indicate an increase in every article exported over that of the preceding year; of leather, by 222,598.10 florins; of corsets, by 214,262.32 florins; of cotton goods, by 43,187.35 florins; and of colors, by 57,665.42 florins. On account of the cheapness of female labor in the rural districts, corsets and embroidered cotton goods are manufactured at a cost which defies competition. It is stated that in the upper rural districts 8,146 persons are employed in embroidering, at from 12 to 16 cents per day. Embroidering is done by machinery as well as by hand, and in the district of Ravensburg machines with two hundred and sixteen needles are severally worked by three hands, with a productive power equal to that of 25 hands. Under the head of leather, in the above list, kid-gloves are represented by a value of 64,142.36 florins. The manufacture of these for exportation is rapidly increasing. Those manufactured at Esslingen (from which city alone, in Würtemberg, they are exported to the United States) are beginning to compete with the kid gloves of Vienna. The increase in the export of colors to this country over the preceding year is represented by 57,665.42 florins. This branch of chemical industry, the production and improvement of colors, (aniline, tar-colors,) is reported as making rapid strides and yielding immense profits. The great increase in the export of leather, and doubtless of some other articles, is to be accounted for, in part, by the fact that previous to the Franco-Prussian war, leather manufactured at Ulm and Reutlingen was first transported to Paris and shipped thence to this country as a French manufacture.

Wealth of Würtemberg.—In a statistical report, Doctor Rumelin, president of the statistical bureau of Würtemberg, reaches the conclusion that the private property in the kingdom averages 6,300 florins ($2,520) for every family, and 1,337 florins ($533) for every individual in it. This conclusion is deduced from the following facts and estimates, represented by figures in round numbers: The kingdom contains—2,731,816 acres of fields; average value per acre, 210 florins; total, 573,000,000 florins; 881,607 acres of meadows, 315 florins, 275,600,000; 121,504 acres of gardens, 420 florins, 51,000,000; 79,964 acres of vineyards, average value per acre, 500 florins; total, 40,000,000 florins; 228,931 acres of pasture-ground, 60 florins, 13,700,000 florins; 1,880,425 acres of woodland, 120 florins, 225,600,000 florins; mining lands, value, 35,000,000 florins; 422,990 buildings, 640,000,000 florins; railroads, 120,000,000 florins; personal and movable property, 700,000,000 florins; capital rents, 400,000,000 florins; total, 3,074,000,000 florins. Deducting 774,500,000 florins for the property owned by the state, townships, and corporations, in saline-works, forests, &c., and estimating the number of families at 365,000, there would be left 6,300 for each family. The average amount for each individual in the kingdom appears to have been found by dividing the total of private property by the number of inhabitants, which is not given.

The same statistician estimates the annual income of the people at 276,000,000 florins, averaging for each family (not reckoning interest on dwellings) 756 florins, ($302.40,) and for each person 160 florins, ($64.) The parts of this income are represented in values and percentage, as derived from the following sources: *From rural industries*, 126,000,000 florins, being 45.9 per cent. of the whole; of which 111,500,000 florins, 40.5 per cent., are from agriculture and cattle-raising; 6,000,000 florins;

2.2 per cent., from wine culture; 4,500,000 florins, 1.6 per cent., from fruit, and 4,500,000 florins, 1.6 per cent., from horticulture. *From products of forests*, 10,000,000 florins, 3.6 per cent. *From mines and peat-beds*, 3,500,000 florins, 1.2 per cent. *From increase in the value of raw materials*, by manufacturing, 120,000,000, 43.5 per cent.; by domestic trade, 6,000,000 florins, 2.2 per cent.; by railroads and mails, 5,000,000 florins, 1.8 per cent.; and *from rents of capitals*, 5,000,000 florins, 1.8 per cent.; total, 276,000,000 florins.

It will be seen from the above that nearly 90 per cent. of the annual production of the people is derived from rural and manufacturing industries, and that the laboring force of the country is pretty nearly equally divided between these two: that is, on the assumption that the average profit is the same with the two classes. Considering those engaged in agriculture as producers, and those in manufactures as consumers of their products, this is probably the best division that could be to promote the interests of the two classes and the steady prosperity of the whole kingdom.

THE COLONY OF VICTORIA.

Mr. T. Adamson, jr., United States consul at Victoria, furnishes information concerning the agriculture of that British colony, situated in the southeastern portion of Australia. It occupies an arrear of 80,944 square miles, being about the size of the State of Minnesota. The following particulars respecting its agricultural and commercial condition, resources, and prospects, are gathered from a report for the year ending November 18, 1871, and are to be understood as not referring to a later date except when so specified. The population now numbers 729,654; among whom there are 70,960 more males than females; 17,770 Chinamen, 43 Chinese females, and 879 aborigines. In 1851, the year in which gold was discovered in the colony, the number of inhabitants was only 77,245. Immigration has been stimulated not only by the allurements of gold, but by a provision of the government through which resident immigrants could procure for relatives and friends desirous of following them, passes, in some instances free, and in others at greatly reduced rates; it being thought that this would both promote the re-union of families and secure a better class of immigrants. Of late free passes have been furnished only to unmarried young women, and a growing opposition to State appropriations for immigrant passage-money has for several years occasioned an annual diminution in the amount, and is likely to soon put an end to them.

Of the total area, 55,644,160 acres, 11,497,066 acres have been alienated from the Crown by sale or appropriation for roads and other public purposes, and 27,370,340 acres are rented until wanted for settlement, under "pastoral licenses" from the Crown, at an aggregate annual rental of £168,000. In 1869 a law was passed which, under certain conditions, gives the right of "free selection" of land before it is surveyed, in all parts of the territory not yet appropriated. For land thus selected or "located," the annual rent is two shillings per acre; but this is allowed as a part of the purchase-money in case the renter buys the selected lot; and he gains a title in fee-simple at the end of five years from the time of selecting, provided he complies with certain conditions relating to residence, improvements, &c. Just what those conditions are, and how large a quantity he is permitted to "select," we are not informed. As might be anticipated, the policy which confers the right of free selection and incipient title, and that by which stock and wool-growers hold lands

"until wanted for settlement" under pastoral licenses from the Crown, do not work harmoniously. The latter class complain bitterly that the right of free selection subjects them to a constant liability to be interrupted in their business and to have their improvements taken from them without compensation.

Agriculture and related industries.—It is claimed that the colony has varieties of climate and soil adopted to all agricultural productions which will grow within the range of climate limited on the north by England, and on the south by Italy. It now produces cereals sufficient for its own demands, though occasional shipments of breadstuffs find their way into it from California and from the adjacent colonies. The climate seems poorly adapted to the growing of maize, and yet it is extensively grown for fodder. Of vegetables, fruit, dairy products, poultry, eggs, &c., the production is fully equal to the demand. In some years potatoes have been produced in such quantities that many have been left to rot because it would not pay to transport them to Melbourne. During the greater part of the year butter sells by the quantity, at 8 to 13 cents per pound. Experiments in shipping it to London, not yet abandoned, have not hitherto resulted very favorably, the apparent ground of failure being a want of adequate intelligence and care in making and packing it—a heavy drawback upon the price of butter in the market, by no means confined to that made in Victoria. It may be owing to a like cause that a few cheese factories started in the colony on the American plan have not thus far been remunerative. The cultivation of sugar-beets has been introduced, and some companies have been formed for the manufacture of sugar and spirits from them; whether the colony can command, at present, sufficient skill and enterprise to insure success in this branch of industry, is yet to be determined. Another industry yet in its infancy is the production of wine. The grape attains great perfection here, and it would seem that intelligence, guided by experience, in the art of making wine, is all that is wanting to make Victoria a great wine producing country. Some incipient steps have been taken in silk culture; but it is thought that a lack of cheap labor must be an insuperable obstacle to success in that business, at least for some years to come. Attention has also been turned toward the culture of the olive for both the home and foreign markets. Among the conditions which favor the production of stock, wool, meats, butter, and cheese are abundant yields of grass and feed. Foreign grasses thrive well. Lucern, Italian rye-grass, and some other varieties of green food for cattle are said to grow with astonishing luxuriance. Wool has lately been selling at so low a rate that many who, in more prosperous times, invested in flocks have been bankrupted; but quite recently heavy advances in the price of wool have revived confidence and the business of sheep husbandry is growing in favor. The arrival of American wool-buyers has largely contributed to this result, and it is hoped that their presence may lead to an increase of trade with the United States in other commodities. During the month preceding November 18, 1871, more wool was shipped from Melbourne to the United States than in the preceding two years. In the return of exports from Melbourne, for 1870, are specified 52,123,451 pounds of wool, (value $15,512,713, averaging 29⅘ cents per pound;) 14,137 head of cattle, ($199,616, averaging $14.12 per head,) and 13,167 hides, ($55,699;) but these are not all products of Victoria, a considerable portion of them having been brought to Melbourne for market or shipment from adjacent colonies.

Manufactures.—Hitherto the great drawback upon agricultural prosperity in the colony has been the want of a home market. Foreign markets are so distant that the cost of transportation more than absorbs all profits on most agricultural products, to say nothing about the impossibility of transporting to a distant market many varieties of vegetables and fruits, (among the most remunerative of farm and garden products when there is a near market,) because of their speedily depreciating or decaying nature. With a view to advance the interests of agriculture by creating a home market, a protective policy was adopted in 1866, the principle of which has recently been extended by an increase of duties on manufactured articles. What the ultimate effect is to be on the prosperity of the colony as a whole is yet to be determined; but, in connection with it, several new industries are springing up, and home manufactures are on the increase. There is now one large woolen-factory in full operation, and two others are likely to be started soon. The principal woolen goods produced thus far are blankets and tweeds. Clothing is manufactured on an extensive scale. Among other nascent manufacturing industries may be mentioned several boot and shoe factories, one paper-mill, and a number of small establishments for manufacturing casks, furniture, coaches, harnesses, whips, leather, &c. The bark of the "whattle tree" is found to be very valuable for tanning leather, and for that purpose hundreds of tons are annually exported. Among the most important and extensive agencies for opening new channels to market for agricultural products are meat-preserving companies. Some idea of the extent of this business may be gained from the fact that one company, within the space of six months, put up the meat of over 9,000 oxen, and about 1,000,000 sheep. The cheapness of live-stock affords special encouragement to this business.

Mining.—The mining of gold is now principally carried on by companies, and from quartz mines, the alluvials having been nearly exhausted. In favorably located mines three pennyweights of gold per ton of quartz pays all expenses, and six pennyweights per ton yields a fortune. The amount of gold mined in Victoria and exported, from January 1 to November 11, 1871, was 1,287,702 ounces, being 169,331 ounces in excess of the amount exported during the corresponding period in 1870. Silver, tin, and antimony are found in the colony in paying quantities. Coal beds have been discovered, but their extent is not yet determined, and, owing to a lack of transporting facilities, they have been worked, as yet, only on a limited scale.

Commerce.—From January 1 to October 28, 1871, the total value of exports was $50,421,276; of imports, $47,382,385. This, compared with the corresponding period in 1870, was an increase in the value of exports of $6,609,068, and a decrease in the value of imports of $2,860,556. These opposite results are thought to be in accordance with the future tendencies of trade in the colony; that is, by a steady increase in the variety and amount of its agricultural and manufactured products, it is to supply more and more its home market, and produce more and more for foreign markets. But there are some important articles for which, if the population increases, there must be an increasing demand, and which must be mainly imported, at least for years to come. Besides various kinds of finer goods, which the colony has now no skilled artisans, and no facilities for manufacturing, there are several articles, necessarily imported, in which the commerce of the United States is

chiefly interested, such as lumber, (there being no soft wood grown in the colony,) tobacco, and the products of petroleum.

There are in Victoria nearly two hundred telegraphic stations, from each of which a message not exceeding ten words (exclusive of the address) can be sent for one shilling, and one penny for each additional word; press-messages for half price. The colony, in addition to its internal telegraphic system, has telegraphic connections with New South Wales, Queensland, South Australia, and by submarine cable with Tasmania, (Van Diemen's Land;) and expects soon to be in direct telegraphic communication with England and the United States. From Sidney, New South Wales, to England, the distance is estimated at 10,665 miles via Brindisi and Suez; and at 13,362 miles via Fiji, Honolulu, San Francisco, and New York.

BRITISH IMPORTS.

WHEAT.—The total of wheat imported by Great Britain, in the first four months of 1873, was 12,296,089 cwts., being an increase of 1,265,889 cwts. over the imports of the corresponding months of 1872. Russia, which was so largely in advance last year, takes the second rank, and the United States stand first, though the receipts from the former in the first four months of 1872 were three times the quantity received from this country. Of these imports, 4,279,829 cwts. were from the United States, against 1,891,316 in the corresponding period in 1872; 4,002,870 from Russia, against 6,592,426 in 1872; 874,818 from Germany, against 775,725 in 1872; 1,062,199 from France, against 59,792 in 1872; from Denmark, 204,122; from Egypt, 524,975; from Chili, 402,374; from British North America, 19,025; and from other places, 827,783 cwts. The average cost, in 1873, was 12*s.* 10*d.*, per cwt.; the cost of that from the United States was 13*s.* 4*d.*; from Russia, 12*s.* 4*d.*; from Germany, 13*s.* 11½*d.*; from France, 12*s.* 9*d.*; and from British North America, 14*s.* 9*d.*

FLOUR.—The total of wheat, meal, and flour was 2,153,068 cwts., being an increase of 1,550,208 over the import in 1872; of which 280,731 cwts. were from the United States, against 181,265 in 1872; 1,244,232 from France, against 114,010 in 1872; 7,368 from British North America, against 930 in 1872. The average cost was 19 shillings per cwt.; cost of that from the United States, 17*s.* 11½*d.*; from France, 19*s.*; from British North America, 18*s.* 7½*d.*; from other countries, 19*s.* 2*d.*

INDIAN CORN AND MEAL.—The import of Indian corn was 4,695,396 cwts., being 449,273 less than in 1872; cost 6*s.* 9*d.*; Indian-corn meal, 1,249 cwts., a decrease of 572 from 1872; cost £2 2*s.* 3½*d.*

COTTON.—The total of raw cotton was 5,498,346 cwts., 271,447 less than in 1872: from the United States, 3,529,867 cwts., against 2,989,888 in 1872; from British India, 812,821, against 1,435,602 in 1872; from Brazil, 183,340, against 459,352 in 1872; from Egypt, 814,268, against 770,722 in 1872; and from Turkey, 33,656, against 31,301 in 1872. The average cost was £4 6*s.* 10½*d.* per cwt.; cost of that from the United States £4 10*s.* 0¾*d.*; from British India, £3 2*s.* 4*d.*; from Brazil, £4 11*s.* 3*d.*; from Egypt, £4 17*s.* 4½*d.*; from Turkey, £4 17*s.* 1*d.*

EXTENT OF CROPS IN GREAT BRITAIN.—The following table exhibits the number of acres in Great Britain under each crop named, and the total under all crops, for the years 1871 and 1872:

	England.		Wales.	
	1871.	1872.	1871.	1872.
Wheat	3,312,550	3,336,888	126,334	126,367
Barley or bere	1,964,210	1,896,403	169,751	168,014
Oats	1,454,144	1,442,075	253,672	256,074
Rye	57,755	52,441	2,338	2,328
Beans	512,929	496,158	4,071	3,312
Pease	382,104	352,733	4,534	5,821
Total under corn-crops	7,683,692	7,576,698	560,700	561,916
Under all crops	23,717,660	23,830,197	2,604,817	2,635,642

	Scotland.		Total for Great Britain.	
	1871.	1872.	1871.	1872.
Wheat	133,010	135,702	3,571,894	3,598,957
Barley or bere	251,822	251,915	2,385,783	2,316,332
Oats	1,007,891	1,007,688	2,715,707	2,705,837
Rye	11,402	12,106	71,495	66,875
Beans	23,835	24,535	540,835	524,005
Pease	2,909	2,991	389,547	361,545
Total under corn-crops	1,430,869	1,434,937	9,675,261	9,573,551
Under all crops	4,516,090	4,538,334	30,838,567	31,004,173

STATISTICS OF GREAT BRITAIN.

Summary of total acreage under each principal crop, and of the number of live stock returned in Great Britain, in each year, from 1868 *to* 1872.

	1868.	1869.	1870.	1871.	1872.
PRINCIPAL CROPS.					
Wheat:	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
England	3,396,890	3,417,054	3,247,973	3,312,550	3,336,888
Wales	130,552	135,562	126,928	126,334	126,367
Scotland	124,683	135,741	125,642	133,010	135,702
Great Britain	3,652,125	3,688,357	3,500,543	3,571,894	3,598,957
Barley or bere:					
England	1,780,201	1,864,088	1,963,744	1,964,210	1,896,403
Wales	151,608	157,582	163,853	169,751	168,014
Scotland	219,515	229,810	244,142	251,822	251,915
Great Britain	2,151,324	2,251,480	2,371,739	2,385,783	2,316,332
Oats:					
England	1,488,470	1,511,975	1,490,647	1,454,144	1,442,075
Wales	257,153	252,970	253,057	253,672	256,074
Scotland	1,011,430	1,017,775	1,019,596	1,007,891	1,007,688
Great Britain	2,757,053	2,782,720	2,763,300	2,715,707	2,705,837
Potatoes:					
England	327,173	356,829	358,890	391,531	339,056
Wales	47,431	49,107	48,602	51,853	48,417
Scotland	166,939	179,275	180,169	184,307	176,615
Great Britain	541,543	585,211	587,661	627,691	564,088
Turnips and Swedes:					
England	1,605,980	1,614,580	1,641,686	1,592,933	1,512,496
Wales	70,350	67,098	70,293	69,833	69,185
Scotland	488,812	489,848	498,932	500,978	561,826
Great Britain	2,165,142	2,171,526	2,210,911	2,163,744	2,083,507

Summary of total acreage under each principal crop, &c.—Continued.

	1868.	1869.	1870.	1871.	1872.
PRINCIPAL CROPS.					
Clover, and under rotation:	*Acres.*	*Acres.*	*Acres.*	*Acres.*	*Acres.*
England	2,370,638	2,004,902	2,766,777	2,694,370	2,822,392
Wales	328,232	260,899	398,282	375,086	370,850
Scotland	1,261,138	1,182,925	1,339,825	1,299,992	1,320,209
Great Britain	3,960,008	3,448,726	4,504,884	4,369,448	4,513,451
LIVE STOCK.					
Cattle, (exclusive of horses:)					
England	3,779,691	3,706,641	3,757,134	3,671,064	3,901,663
Wales	593,373	589,108	604,749	596,588	602,738
Scotland	1,050,917	1,017,724	1,041,434	1,070,107	1,120,593
Great Britain	5,423,981	5,313,473	5,403,317	5,337,759	5,624,994
Sheep:					
England	20,930,779	19,821,863	18,940,256	17,530,407	17,912,904
Wales	2,668,505	2,720,941	2,706,479	2,706,415	2,867,144
Scotland	7,112,112	6,995,337	6,750,854	6,882,747	7,141,459
Great Britain	30,711,396	29,538,141	28,397,589	27,119,569	27,921,507
Pigs, (exclusive of those kept in towns and by cottagers with less than one-fourth of an acre of land:)					
England	1,981,606	1,629,550	1,813,901	2,078,504	2,347,512
Wales	187,319	171,675	198,547	225,456	238,317
Scotland	139,614	129,227	158,690	195,642	185,920
Great Britain	2,308,539	1,930,452	2,171,138	2,499,602	2,771,749

CATTLE-RAISING IN TEXAS.

In the latter part of January last this Department addressed to correspondents in all the counties of Texas in which cattle-raising has been a prominent industry, circulars, soliciting accurate information respecting the extent, modes, profits, and tendencies of that business in their respective localities. Correspondents known to have special facilities for obtaining the information desired were requested, after careful investigation, to give facts and estimates, based on reliable data, respecting the total number of cattle, the proportion of different classes named, the amount of feeding and care bestowed; the cost and profit of raising, and some indication of the size of the larger herds. The information embodied in a large number of responses is here presented in condensed form.

MODES, COSTS, AND PROFITS OF RAISING.—The prevalent custom, to which there is scarcely an exception, is to let herds run at large the year round, without any feeding. Hence, besides taxes and interest on the amount invested in the herd, the only expenses are for herdsmen and their equipments, for additional help in branding and marking, and for marketing. In herding advantage is sometimes taken of the principle of co-operation. Our correspondent in Cooke County states the leading facts of cattle-raising in Texas thus:

The cost of raising cattle in this county is the interest on the money invested, (and the cost of a stock is commonly $6 per head from yearlings up;) the tax on the value of the stock, and the cost of the hands and horses to attend to them about five months of the year. One hand and four horses are required to the thousand head. Several stock-raisers operate in connection; hire a man to drive the provision wagon and cook for the hands; and by thus throwing their forces together it does not require so

many men and horses as it would were each stock-raiser to operate alone. Hands can be hired at from $15 to $20 per month. The horses employed are range-horses, and they subsist on the grass. They will gather up their cows, calves, and beeves, drive them to the most convenient ranche, pen them, mark and brand the calves, let the cows and calves go, but hold the herd of beeves. A "ranche" here is any farm house, or even a cabin, on the prairie, with an inclosure used for penning cattle. Stock-raisers in Cooke, for instance, will hunt their cattle in Denton, Tarrant, Wise, Montague, and Grayson. They gather up, mark and brand, from time to time and turn loose. All stock cattle and horses must make their own living on the range. Cattle receive no attention from the owner, save that of marking, branding, and gathering for sale. Steers are generally thrown upon the market at four years old; but in any lot of cattle gathered as beef-cattle you will find more or less from five to seven years old, which are always in better condition than the four-year-old ones, and stand driving better. Barren cows are sold at from four years old, upward. Owing to the high price of corn, cattle, beyond a very insignificant number, are not fed for the market. Those who make it a business drive their cattle to Missouri, or farther north, where corn, &c., can be purchased at comparatively low rates.

This correspondent states that a leading stock-raiser, who had kept a strict record for seven or eight years, found that, in from 600 to 1,000 calves annually branded, the difference between the males and the females never exceeded twenty. He further reports that Texas cattle are evidently deteriorating; that they do not attain to the same size at the same age they once did, and "not nearly so many heifers become mothers at two years old as formerly, when the range was much better." He estimates that at present the number of calves found for branding in the spring is one-fourth of the number of the whole herd; but "some few years ago, cattle properly attended to would double their number in three years." The profits, formerly 33 per cent., are now assumed to be only 25 per cent.

A few extracts from other correspondents will afford additional light respecting treatment, cost, and profit:

Guadalupe: When the calves are a few weeks or months old they are branded and turned loose, and perhaps never seen again by the owner until driven up to be sold or butchered, or to secure the calf by branding. No one in our county pretends to herd his stock, except when they are brought together to be sent to market. The increase is about all profit, there being almost no expense incurred in feeding or wintering. *Kaufman:* Herding the only cost; profit, about 30 per cent. *Liberty, Chambers, and Jefferson:* Cattle support themselves upon the natural grasses, and the only care exercised is by superintending herdsmen, whose force is doubled in the spring at marking and branding time. Stock-men have lost seriously this winter, and the profit in raising is reduced to about 25 per cent. *Travis:* In this county cattle are permitted to run at large on the prairies, and are only collected in herds at the nearest pens at branding time. No feeding in winter. Hands are hired at $20 per month to brand and mark. *Mason:* The actual cost of raising, or rather permitting a male calf to raise itself to be a "four-year-old beef," is literally nothing, except the marking and branding of the calf, and the interest on the capital invested in the mother-cow. The cost of marking and branding ranges from 25 to 50 cents per head, never more. Average four-year-old beef-cattle are selling here this spring at $12 in coin per head; choice beef-cattle, at $18 per head. *Austin:* The only care heretofore has been the gathering and branding of the cattle in spring, also of those cattle that have left their customary range. If done by others, it has been the custom to give every fourth calf. The ruling rates for stock-cattle the past year were from $5 to $6 specie per head; beeves for the city market, $14 specie per head. *Atascosa:* It costs about one-fourth the gross profit to raise cattle for market. Feeding is entirely dependent on the wild grasses. In caring for cattle we have to keep hands in the work two-thirds of the year, furnishing, for one thousand cattle, about ten horses and two hands at $15 per month, and provided with horses, coffee, breadstuff, and salt, but no meat, as they furnish themselves with fat calves. The size of herds in this county ranges from 300 to 10,000. *Grayson:* Heretofore there has been no cost attending the raising of cattle, except that of branding and marking; that usually costs the owners of large herds the hire of a few hands for some two or three months. There are no cattle fed here except a few milch-cows and work-oxen. Good beef-cattle are worth from $15 to $20 per head, and do not cost, I presume, the producers more than $1 per head. Milch-cows are worth from $10 to $20 for cow and calf. Stock-cattle, cows, and calves, and two-year-olds, will average $5 per head. Our butchers are still (February 3) buying cattle from the grass, and we have some for beef still on the market.

The range of estimates for the cost of production, it will be noticed, is somewhat wide. This may be due in part to variation of the margin between the estimates and the actual cost; but probably is chiefly due to a corresponding range in actual cost, owing to different degrees of advantage or disadvantage of location or surroundings, and extent of losses in severe weather, and especially to different degrees of business tact.

LOSSES.—Texas is probably before any other State or Territory in advantages for raising cattle without expense for feeding, shelter, or inclosure. But even here the risks and liabilities to losses, for the want of such conveniences, are so great as to almost force the conclusion that smaller herds of better quality, with provision for pasturage, feeding, and sheltering as occasion required, would be more profitable. The return from Refugio represents that two years ago the number of cattle in that county, according to accurate estimate, was not less than 100,000, but deaths from starvation the last two winters will reduce it to 50,000. In Guadalupe, last winter, while the few who provided pastures saved the most of their cattle, the loss, from cold and starvation, was terrible. In Hunt, owing to the severity of the winter "many of the yearlings have died, and many more will" before grass springs up anew.

Bexar: Cattle are dying so fast that no one can tell how many are left, or how many are gone. Some say more than one-half are already dead, and others put it still higher. One man informs me, that during a trip from the coast up here, one hundred and fifty miles, he was rarely out of sight of dead horses and cattle, and in one place he stood and counted eighty mares and colts (dead) within fifty yards. This of course only applies to stock within the line of settlements—farther west where there are very few settlements and less stock they do better. Not the least preparation of any kind is made to feed cattle, horses, or sheep, except those kept up for use, and the supply of grass has become exhausted—eaten and tramped out.

The returns from Atascosa and Live Oak Counties, represent that the severity of last fall and winter has been so fatal to cattle that it is impossible to estimate the numbers now living; from Medina, that "under the trying circumstances of last winter—no grass, and intensely cold weather—nearly one-fourth of all our cattle perished; and milch cows in a large proportion;" from Grimes, that "my neighbors and my own experience is, that out of 300 to 500 head each, our stocks have gone down 50 per cent. in less than six years, without selling or using 25 per cent. of the increase;" from Austin, "that, as the large stock-raisers do not feed their cattle, and as owing to a four months' drought in the fall, they were reduced at the beginning of winter, they are dying in large numbers, and it is safe to estimate the loss by death, the present disastrous winter, at between 25 and 30 per cent.;" from Mercer, that, "the mortality of cattle during the winters of 1871 and 1872 has been without a parallel—principally among cows and the younger stock. The most reliable estimate I can get of calves branded in 1871 was 75,000, and in 1872, 60,000. How many of them are now living, I can give you no estimate that I would consider reliable. Cattle stocks are generally calculated at the rate of 4 to 1—that is, if a stock brands 1,000 calves, it is estimated that the stock is 4,000 head—but it rarely ever gathers that number of late years."

MILCH-COWS AND WORKING-OXEN.—In the cattle-raising sections of Texas, the number of cows and oxen raised and trained for domestic uses, whether for home use or to be marketed, is comparatively small. According to the report from Refugio, "not more than one in a hundred

of cows is milked, and not more than one in a hundred of the male cattle is broken to work." Reports agree in representing that very little attention is given to the quality of milch cows, and that they and working oxen receive very little feed or extra care.

Mercer: But few cows have been milked the last few years, on account of the scarcity of grass around the ranches, and no ranchero pretends to supply himself with hay or fodder for milch cows. Nearly all the old and gentle ones have died, and we will, if we want milk, have to get gentle, young stock. Oxen have, in a measure, given way to horses and mules. The most serious loss to the cattle-men last winter was bulls. The law requires a bull to be left with every 40 cows; it has not been done, and the old stock nearly all died out. This will be felt worse next year. *Hunt:* No cost of any consequence is incurred in feeding milch cows or working oxen. They subsist on the range, and few cows are milked during the winter months. *Medina:* No stables are provided for milch cows. They are fed on hay and corn-fodder during the milking season, whenever, from lean state of pasture, necessity requires, but not otherwise. So are working oxen during the working season. *Bexar:* Our system of cattle-raising is all wrong. We should have a less number, but of better quality. It takes, on an average, ten of our cows to give a water-bucket of milk, poor at that, while, I am told, one northern cow will give it twice a day. Ten Texas calves in the fall will not sell for over $15; and, I am told, one northern calf is worth as much. Then, why should we keep ten, when one will yield as much. I have also learned that an improved blooded beef in New York market is worth $40 more than a Texan, and that they will generally weigh 25 per cent. more at the same age. *Fayette:* Working oxen are diminishing rapidly, being substituted by mules and horses for wagoning and farming purposes.

MARKETS.—A large number of Texas cattle are sold to traders by producers at their ranches, to be driven into adjoining, or shipped to more remote States, where corn is much cheaper and stock much higher, and then fattened. A smaller proportion probably is sold at home, to be taken to market for beef without further fattening; and to some extent operators themselves drive their beeves, as collected from the ranches, to markets in Texas and neighboring States. Feeding cattle for market is scarcely known in Texas. Milan County reports that about 3,000 head were driven from that county to Kansas and other markets in 1872, at a net profit of $10 per head; Medina, that for the last two years all their beeves have been driven to Kansas, where, after deducting all expenses for driving, they have netted $13 to $17 in gold per head, (the ages ranging from three to five years,) and three-fourths of these proceeds are estimated as net profits, that is, after deducting all expenses of raising and marketing the animals, kept from three to five years, the profit is from $9.75 to $12.75, in gold, per head. But it is probable that in estimating this profit on the animals which are raised and sold, there is no offset for the immense number which are raised and perish in such winters as the last. The return from Burnet represents that, on account of the limited home market, stock-raisers have "had to resort to driving their surplus stock to Kansas; an operation by which many farmers have lost more money on one trip than they ever gained for many years previous." In Fayette "all beef-cattle, over three years old, are sold off every spring, and driven into Kansas and other markets."

CHANGES.—This system of cattle-raising now prevailing in Texas can never co-exist with agricultural improvement. So far as it does prevail, to that extent it must prove an effectual bar to immigration, and to all forms of manufacturing, mechanical, and diversified agricultural industry. The natural causes, therefore, which are operating to diminish its profits and necessitate its decline, whatever temporary losses they may occasion, are evidently working for the future good of the State. They are preparing the way for superseding an

exclusive system of rural industry, which, though it brings to a few, and only a few, very great profits in some years, yet largely reduces the annual average of profits by the very great losses it brings in other years, and which militates against almost all other forms of industry in the same section, necessitates a sparse population, and prevents internal improvements generally.

The following extracts will show the changes in cattle-raising now taking place in Texas. Some of them also point to or suggest the further changes and the ultimate advantages to result from them:

Hunt: The raising of cattle in this county is rapidly decreasing; owing, first, to failure of range, the settling up of the county, and the disposition of owners to turn their attention to agricultural pursuits; second, to the prospect that a fence law will be passed by our legislature. *Milan:* Grass is giving out, and stock-raising is falling off 35 per cent. yearly; in its stead agricultural interest is advancing rapidly. *Mercer:* The cattle men will have to buy land and put cattle upon it so as not to overstock it, or abandon the business. Public opinion and the rights of other parties will not submit any longer to this buffalo mode of raising cattle. The whole country is now eaten out by wandering herds of cattle and horses, and where beautiful grass formerly grew nothing but weeds can be seen. *Burnet:* The yearly increase of herds from some causes, especially the scarcity of food during winter, has not been as large of late as in former years. The size of cattle is also diminishing. *Grayson:* The cattle-herding system of our State has very materially changed in the last six years, and large herds are no longer found in this county. The most of them have been transferred to Wichita County, some one hundred and fifty miles west of this. There are no cattle fed here except a very few milch-cows and oxen. But the old programme must now be changed. Our wild grass is rapidly giving way, and as yet we have no tame grass that we can rely upon, and our cattle will have to be fed from our fields. Fine varieties are now being introduced, and they will take the place of our long-horned or Texas cattle, provided they acclimate well. *Lyon:* Cattle-raising, which has never been extensively carried on in this county, is gradually on the decrease, owing to the fact that the people are devoting almost their whole attention to farming. *Grimes:* A small herd of cattle will not pay well, as without strict attention they would all be stolen or killed out. It is a safe estimate to say that this county (now estimated to have 23,000 head) ten years ago had over 50,000, if not quite 60,000, head of cattle. Farmers are now turning their attention to improved stock; but not much can be done in that line until pastures can be fenced. *Fayette:* This county is ceasing to be a stock-growing one, and is rapidly being settled and fenced up for agricultural purposes. *Austin:* Many of our stock-raisers are getting discouraged, and are of the opinion that cattle-raising is no longer profitable, and are selling out.

SIZE OF HERDS.—A large portion of our correspondents overlooked the request that the number of cattle in the herd be given, with the name of the owner. The following are names of owners and numbers of some of the larger herds reported: *Kaufman:* Bailey Dougherty's numbers 2,000; J. Nash's, 1,500; John Moore's, 1,000; J. Hardin's, 1,000; Dr. Pyle's, 800. *Refugio:* Thomas O'Coner's, 3,000; John H. Wood's, 17,500; John Linny's, 17,500; J. and R. Dushel's, 9,000. *Hunt:* J. Harris's, 5,000; Jacobs & Black's, 2,000; Frederick Black's, 1,000; Thomas King's, 2,000; E. J. Jacobs and E. Cox's, 1,500; McDonald & Co. s, 1,500. *Cooke:* Samuel E. Doss's, 5,000; William Downard's, 4,000; Widow Loring and sons's, 2,500; W. J. Morris's, 2,000; Mrs. Brother's, 1,500; Frank Gooding's, 1,200; Elijah Parry's, 1,000; Mrs. Long's, 1,000. *Mason:* Ben. F. Gooch's, 20,000. *Austin:* E. Johnson's, 3,000; The brothers J. and J. Hill's, 4,000. *Fayette:* James Reynolds's, 4,000. *Grayson:* Burrel Yolooroo's, 10,000, scattered over ten or fifteen counties.

TOTAL NUMBER.—The following table shows the total number of cattle, and the proportion in the several classes specified, in the counties named:

Counties.	Milch-cows.	Working-oxen.	Herds.			Total of cattle.
			Under one year old.	Yearlings.	Two years old and over.	
Kaufman	1,000	500	3,000	3,000	500	8,000
Guadalupe		4,000	3,535	6,186		35,352
Hunt	2,000	1,000	6,000	5,000	6,000	20,000
Liberty	267	178	3,333	1,667	7,888	13,333
Chambers	267	178	3,333	1,667	7,888	13,333
Jefferson	267	178	3,333	1,667	7,888	13,333
Milan	3,000	2,000	8,000	6,000	17,000	36,000
McLennan		1,000	9,914			39,657
Refugio	500	250				50,000
Travis	3,000	300	3,000	4,285	16,715	30,000
Cooke		350	7,000	5,600		28,000
Medina		800	13,000	13,000		65,000
Burnet	800	5,000	10,000	7,500	19,500	50,000
Mason			8,000	8,000		40,000
Austin			12,500	12,500		50,000
Atascosa		1,000	6,000	1,500		30,000
Hood		600	3,000	3,000		13,000
Grimes	3,450	2,760	5,060	4,600	7,130	23,000
Fayette						35,000
Grayson	2,000	1,000	5,000	5,000	24,000	37,000
Leon	3,600	1,200	2,400	2,400	2,400	12,000
Total						642,558

The number of cattle in the twenty-one counties above named, reported for the census of 1870, and for State assessment the same year, were as follows:

Counties.	Reported for the census of 1870.				Reported for assessment in 1870.
	Milch-cows.	Working-oxen.	Other cattle.	Total.	Total.
Kaufman	3,033	675	21,935	25,643	25,043
Guadalupe	6,061	2,358	49,096	57,515	40,553
Hunt	9,672	2,077	25,141	36,890	29,266
Liberty	2,706	714	23,601	27,021	24,132
Chambers	1,205	334	24,338	25,877	23,861
Jefferson	743	204	15,103	16,050	45,445
Milan	4,106	1,564	23,142	28,812	
McLennan	3,774	1,131	20,857	25,762	30,326
Refugio	1,556	584	99,785	101,925	89,408
Travis	8,952	8,991	30,765	48,708	29,031
Cooke	3,015	994	26,509	30,518	26,101
Medina	8,264	1,337	32,960	42,561	51,971
Burnet	3,023	787	20,078	23,888	29,837
Mason	2,588	229	16,885	19,702	34,120
Austin	10,009	4,473	44,576	59,058	58,205
Atascosa	4,656	919	92,047	97,622	166,764
Hood	3,348	573	15,525	19,446	14,314
Grimes	5,779	4,765	17,814	28,358	22,463
Fayette	10,836	4,321	40,272	55,429	44,446
Grayson	4,840	1,704	24,463	31,007	24,710
Leon	5,263	1,414	18,041	24,718	24,638
Total in twenty-one counties	103,429	40,148	682,933	826,510	834,634

From the foregoing tables it appears that the twelve counties which report to this Department in 1873 a total of 20,151 milch-cows, reported in 1870 for the census 50,878; the eighteen counties which report in 1873 a total of 22,294 working-oxen, reported in 1870, 31,118; the twenty-one counties which report in 1873 a total of 642,558 cattle, reported in 1870, 826,510; the twenty counties which report in 1873 a total of 606,558 cattle, reported in 1870 for the census 797,698, and for assessment 834,634.

Taking into consideration the unquestioned fact that the returns for

assessment, on the average, fall considerably below the actual number, this comparison indicates a falling off within three years of not less than one-third in the aggregate numbers of cattle in the portions of the State covered by the reports. It also indicates that there are now in the counties reported only three-fifths as many milch-cows as there were in 1870; but it is quite probable that some of the reporters for the census did not distinguish between "milch-cows" and "cows that give milk." For instance, Hunt County reported a number of milch-cows equal to one-fourth the total number of cattle, which is just the proportion of "mother-cows" usually estimated as the average in herds and aggregates. The decrease in the number of working-oxen is sufficiently accounted for by concurrent statements of our correspondents that they are being gradually superseded by horses and mules.

FACTS FROM VARIOUS SOURCES.

A SUCCESSFUL EXPERIMENT IN TEACHING AGRICULTURE.—Soon after the close of the war there was formed in Baltimore an association of Friends for the purpose of advising and assisting impoverished Friends in the Southern States. The immediate object was to afford physical relief; but as the continuance of physical want can only be prevented by removing its causes, the association wisely connected with their beneficence a system of mental, moral, and religious education. Their principal field of operations was in the rural districts of western North Carolina. In the outset they were met by a difficulty which they foresaw, unless removed, must prove an insuperable obstacle in the way of effectually helping a community, where want of bread and want of intellectual and moral culture extensively prevailed, to rise to a condition in which they could support and educate themselves independently of foreign aid. Homes provided with facilities for secular and religious education imply adequate means. With a rural population these can be obtained from no other source than the soil. But in the section where their advice and aid were most needed, the soil had become so impoverished by thriftless cultivation, the herds and flocks were of such inferior, unremunerative varieties, and the prevalent modes of husbandry so necessitated, not only scant returns, but a still further exhaustion of the soil, that, without a change for the better, continued poverty and dependence were inevitable. Besides, it being the prevalent notion that the meager products of the land were owing, not to a defective style of farming, but to a worn-out soil, the disposition of the more capable and enterprising, especially among the young, to emigrate seemed to be restrained only by the want of means to get away. With a view to remedy this discouraging state of things, the association, in 1867, purchased a farm of 200 acres, located at Springfield, on the dividing line between Randolph and Guilford Counties. On this they placed, as their superintendent, an experienced and enterprising farmer, and furnished him the means of teaching improved agriculture by exemplifying its processes and by bringing within the reach of the farmers in the region round about the necessary facilities for entering upon a career of improvement themselves. He was expected to conduct his farming operations in such a way as to *show* to the farmers in the neighborhood what modern improved agricultural machines and implements are and how they are worked; what advan-

tages there are in utilizing all the manure that can be made on the farm, and superadding chemical and other fertilizers; in deep plowing and thorough cultivation; in draining and under-draining; in adjusting soils, fertilizers, and crops to each other by rotation and otherwise; in superseding, or at least improving, small, scrubby native cattle, sheep, and hogs, by thorough-bred stock; and in increasing the stock capacity of the farm by the culture of new grasses and other varieties of green fodder. He was also to be the agent of the association for bringing within the reach of farmers in that locality, and furnishing at cost, or nearly so, selected seeds, improved agricultural implements, and blooded stock, and for organizing agricultural clubs and awakening a spirit of inquiry and enterprise by lectures on farming, circulating agricultural newspapers, &c. The results of this practically benevolent enterprise have equaled the most sanguine anticipations of the association. In the winter following the purchase of the farm, through the agency of its superintendent many farmers' clubs were organized, nearly four hundred subscribers to agricultural papers were obtained, and about two tons of clover-seed were distributed at cost. In 1871 (no reports have come to hand for the intervening years) the superintendent reports, not only that the farmers in the immediate region are making rapid strides in agricultural improvement, but that the central leaven is extending from them into regions more remote. Among the evidences of this are noted, first, the greatly increased demand for clover-seed. At the time the farm was purchased, throughout that region the want of pasture and hay was an insuperable obstacle in the way of keeping stock to any extent. To meet this want the association made special efforts to secure a general introduction of clover. In 1868, in addition to two tons of clover-seed, several tons of the best Peruvian guano were forwarded to the superintendent, with instructions to furnish both the seed and the guano at cost to farmers willing to test them in conjunction. It was found that after once "setting" the clover on exhausted soil with guano there was no necessity for further use of it. In 1871, as a direct consequence of the example and facilities afforded by the association's farm, over 10,000 acres had been successfully seeded to clover, and the superintendent was confident that very soon clover would be largely cultivated on every farm in western North Carolina. A second evidence of a growing interest in agricultural improvement was found in the demand for improved agricultural implements. Among those he had furnished were mowers, reapers, wheel-rakes, iron and cast-steel plows, cultivators, clover-seed gatherers, &c. And it was observed that, into whatever neighborhood one of these agricultural machines, which supersede hand-power by horse-power, goes, it immediately becomes a silent orator which successfully pleads for the removal of stumps, stones, knolls, and filling hollows, and for the under-draining of places too wet and soft for horses and machine to pass over. A large amount of under-draining had been done on almost all the farms for many miles around. A third evidence was apparent in the increasing numbers who visited the farm for the purpose of *seeing* what is done on it and *how* it is done. In the spring of that year strangers came in such numbers that it required nearly the whole time of the superintendent to show and explain the improvements they had come to see and learn about.

Of thorough-bred stock, kept for production on the farm and for propagation in the surrounding region, there were five head of Alderneys, a Southdown buck, a Chester sow, a Berkshire boar, and, in greater or less numbers, offspring and crosses from the same. During the year, on

a small stream running through the farm, at a cost of $875 a bone-mill had been built, which will crush and grind 1,500 pounds of bones per day. It is believed to be the first ever built in North Carolina, and from it great benefits to the farms in the vicinity are anticipated. The superintendent thinks the region is well adapted to fruit-growing; and, in view of the results of experiments since he began his farming operations there, he is convinced that the choicest fruits can be grown on the poorest soils by fertilizing them with peas plowed under, and mulching the trees with leaves. He has made experiments in soiling for two years, and with so favorable results that he intends to feed in that way all the cows and heifers on the farm next year. He says:

Last year I took from twenty square rods the food for one cow one hundred and twenty-two days, and this year have had nearly as satisfactory results. I have now growing one and a half acres of rye and one acre of oats for first feeding in the spring, to be followed with lucerne, Hungarian grass, orchard-grass, clover, and corn, and wind up with beet, carrot, and turnip tops. The bull and one cow have not been out for eighteen months, and are perfectly healthy. Labor is cheap, but manure is the great desideratum.

In their report for 1872 the association represent that their agricultural enterprise at Springfield, with respect both to the farm and to the beneficial results they designed by it to diffuse through the neighborhood and over the State, has been favored with continued and growing success. On the farm, now well stocked with horses, mules, cattle, sheep, hogs, and fowls, the barn was full, very large crops of hay, wheat, and corn having been produced. From a field of seven acres, which up to within three years had been covered with briars and sassafras, and considered the most exhausted part of the farm, 170 bushels of wheat had been harvested, 40 bushels from one acre, the other six averaging 21⅔ bushels.

The superintendents both of agriculture and education are reported as receiving the hearty co-operation of all classes of citizens, and as frequently invited to deliver public addresses relative to their respective departments, not only in the neighborhood of their central operations, but in distant parts of the State. The educational efforts, first made with the special design of encouraging and aiding the children of needy Friends, have now grown into general and permanent schools. In eleven adjacent counties, out of 6,000 children who have received instruction since 1866, more than half were from families not connected with the order of Friends. The superintendent of the farm reports to the association the following interesting summary of results thus far:

The effect of our operations on the community has been gratifying, and can be seen for fifty miles around. About 15,000 acres have been sown with clover in the surrounding counties since our operations commenced. Many improved implements have been introduced. Instead of the scythe and the cradle, are frequently seen the mower and the reaper. Large numbers of people from all parts of the State continue to visit the farm, to see for themselves the new way, and they very generally express themselves satisfied that it is an improvement on the old exhaustive system. All such, more or less, will become centers of influence and improvement. The effect of our educational and agricultural efforts in staying the tide of emigration to the West is very apparent, and has already saved to North Carolina hundreds of her best citizens.

STATISTICS OF BUTTER AND CHEESE PRODUCTION.—The averages involved in the statistics of butter and cheese production are frequently brought forward at the meetings of dairy associations to show the progress of these industries and to illustrate certain points connected with their management. The census of 1870, supplementing other data, affords the means of presenting some of these averages with more precision.

and completeness than have hitherto been possible. The following abstract is founded chiefly on the census publications of the three past decades, compared with official tables of imports, exports, &c.:

From 1850 to 1860 there was an increase of 47 per cent. in the butter product of the United States, and a decrease of 2 per cent. in the cheese product; increase of population 35½ per cent. From 1860 to 1870 the cheese product increased 57 per cent., and the butter product 12 per cent.; increase of population 22½ per cent. For the twenty years, from 1850 to 1870, the increase of the cheese product was 54 per cent., and that of the butter product 64 per cent.; increase of population 66 per cent. The growth of the cheese interest from 1860 to 1870, consequent on the rise and extension of the cheese-factory system, presents a remarkable contrast to the exhibit of the preceding decade. The average annual export of cheese (domestic product) during the ten years ending June 30, 1870, was 43,641,796 pounds, against an average of 7,853,383 pounds for the preceding decade. The exports of 1871 and 1872 averaged nearly 65,000,000 pounds.

The census of 1870 states the number of cheese-factories in the United states at 1,313, and their product of cheese at 109,455,229 pounds, showing an average of 83,363 pounds per factory; number of cheese-factories in New York, 818, averaging 95,362 pounds of cheese. This statement of production chiefly covers the favorable season of 1869. On referring to the New York State census of 1865, it is found that the reports of 380 factories exhibited an average of 83,278 pounds of cheese, and 424 reports showed an average of 307 cows per factory for the season. One hundred and thirty-three factories, "using the milk of 300 cows and upward," gave full statistics, including the length of the working season, the latter averaging a little more than six months; average number of cows, 504; average of cured cheese per cow, 283 pounds; average product of cheese per factory, 142,432 pounds.

From comparison of all attainable data, it would appear that in 1869 and 1870 the cheese-factories of the United States did not average over 300 cows each, and that the average of cheese per cow for the working season fell below 300 pounds. There is no reason to believe that this average of cows has been increased since that time; indeed, the reports of the dairy associations have indicated a tendency in the contrary direction. New York factory statements, appearing in the reports of the American Dairymen's Association, show that 400 pounds of cheese per cow for a season of seven months to seven and a half months fairly represent the extreme averages of the State—that is to say, averages covering a long season.

The United States census exhibits of 1850, 1860, and 1870, collated with statistics of export and import, show, for each individual, an average yearly consumption of butter ranging from 13¾ to 14¼ pounds, the latter figures being for the middle period, or that of 1860. The average consumption of cheese has ranged from very nearly 3 pounds to 4 pounds, the latter being the exhibit of 1850. For 1870 the rate was a little over 3 pounds per individual. Mr. G. E. Morrow, of Madison, Wisconsin, secretary of the Northwestern Dairymen's Association, states that Madison, with a population of about 10,000, averaged, in 1872, a consumption of 4 pounds of cheese per individual.

The following table shows the rates of increase of the butter and cheese product, during twenty years, in the States named, with the rates of increase of population:

States.	Percentage of increase of population.			Percentage of increase in amount of butter produced.			Percentage of increase in amount of cheese produced.		
	1850 to 1860.	1860 to 1870.	1850 to 1870.	1850 to 1860.	1860 to 1870.	1850 to 1870.	1850 to 1860.	1860 to 1870.	1850 to 1870.
New York	25½	13	41	29	4	34	Loss, 2½	107½	102½
Pennsylvania	25½	21	52	47	4	53	.....	11	11
Ohio	18	14	35	41	3½	46	4	12	16
Illinois	101	48½	198	124	28½	188	44	212	349
Michigan	88	58	197	119½	57	245	62	41½	129
Iowa	251	77	521	450	130	1,167	338	46	540
Wisconsin	154	36	245	274½	65	518	176	198	722
Vermont	½	5	5	31	12	47	Loss, 6	Loss, 5	Loss, 10½
Indiana	36	24½	70	42	25	78	Loss, 3	Loss, 34½	Loss, 37
Massachusetts	24	18	46½	3	Loss,21	Loss,19	Loss, 25	Loss, 22	Loss, 42
Maine	8	Loss, 1-5	7½	26½	Loss, ½	26	Loss, 26	Loss, 36	Loss, 53
New Hampshire	2½	Loss, 2½	.....	Loss, ½	Loss,14	Loss,14½	Loss, 30	Loss, 61	Loss, 73
North Carolina	14½	8	23	14	Loss, 9	3½	Loss, 47	142½	29

GROWING SUGAR IN LOUISIANA.—Our correspondent in the parish of Terrebonne writes as follows:

Our sugar-crop last fall was seriously injured by freezes on the 15th, 16th, and 17th of November. The canes were killed to the ground, and nothing but the cool weather which followed prevented them from becoming sour and an entire loss. Taking the depreciation in quantity and quality into consideration, the loss may be put at one-fourth of the crop. A good deal of seed-cane also was caught before windrowing and destroyed. One of the principal difficulties in sugar culture in this climate is the protection of the seed through the winter. Every conceivable plan has been tried, and all sometimes fail. Protracted rains, or unseasonably warm or intensely cold or very dry weather, injure the seed more or less, either in mats or windrows. The last winter was generally cool, without hot spells, and without severe freezes. There were frequent showers, and no long wet or dry seasons. The result is that the seed-cane kept better than has been known for many years. Having this first and great advantage to start with, we have secured a first-rate stand of plant-cane. The spring has been rather too cold, but still the plant-cane is two or three weeks in advance of what it was last year. The stubble-cane cut before the freezes in November was injured by those freezes, and is backward; but what was cut after that period is very promising. Up to the 13th of May we had but little to complain of, but on that day the rains set in and have continued up to this time, (the 31st.) There is still ample time, however, to make up for this loss, if we can get a few weeks' seasonable weather. The cane has been growing luxuriantly all the time, and the only danger is that the grass will injure it. The corn-crop will be injured, and some will have to be given up to save the cane if we do not have dry weather soon. With our exotic crop much depends upon the advancement of the plant, and how the growing crop compares with that of previous years becomes a question of interest. For several years I have kept a weekly record, which I find valuable. A quotation follows:

"Record for May 18, 1873: First planting of the cane in the spring averages 380 stalks per 100 feet. Last planting of cane in the spring averages 230. Fall-planted cane averages 175. First year's stubble averages 220. Second year's stubble averages 150. For the same date last year: First planting of cane in the spring averages 230 stalks per 100 feet. Last planting of cane in the spring averages 140. Fall-planted cane averages 160. First year's stubble averages 200. Second year's stubble averages 110."

I find that a record of condition three weeks later comes nearest to the final result: "June 2, 1872: First planting of cane in the spring averages 330 stalks per 100 feet. Last planting of cane in the spring averages 250. Fall-planted cane averages 180. First year's stubble averages 230. Second year's stubble averages 170 stalks per 100 feet.

These records show the marked advantages to be derived from spring planting, and develop many facts which might otherwise pass unnoticed. In making these records I take, in different parts of the field, rows of an average thickness as nearly as can be told by the eye, measure off 100 feet, and, with the assistance of a light cane, count all the shoots out of the ground. These counts are averaged, and the result put down for that of the class to which it belongs. Up to the 1st of June the height of the cane is a matter of no importance, the main point being its thickness in the row.

GRAPE-CULTURE NEAR WASHINGTON.—A correspondent furnishes for this Department an account of a successful experiment in grape culture made by himself. The location is on the south bank of the Potomac, about two and a half miles above Washington, on a tract of land purchased by him since or during the late war. He says:

I found upon this land that had been stripped of timber by the Army during the war, growing in the greatest luxuriance, thousands of wild grape-vines. As some of them had attained an enormous size, running to the tops of the highest trees, it occurred to me that the soil must be especially adapted to their growth, and if so, the cultivated varieties ought to do at least equally well. I consulted such men as Dr. Warder, of Ohio, and William Saunders, of your Department, who, after examining the soil, pronounced it "a perfect grape-soil." I therefore resolved to try it, and, in the spring of 1866, planted one thousand vines, half of which were the Concord, and the balance other popular varieties. I procured first-class vines, and planted them with great care, as follows: Selected ground sloping to the southeast and east, plowed it from 8 to 10 inches deep, harrowed it fine, and planted in rows 8 feet apart both ways; set an 8-foot stake at each plant, and mixed with the soil, about the roots, one quart of ground bone and a shovelful of old, well-decomposed stable-manure; pruned the roots, also cut the top or vine back to three or four buds; and when the buds had grown from 1 to 2 inches, rubbed off all but one, the strongest; trained that to the stake by tying, and pinched off at second leaf all lateral shoots, thus concentrating the growth in the one cane; gave them clean cultivation. The next February, when there was no frost in the wood, I cut it back to three or four buds of that year's growth, and let only two buds grow; trained and managed these two canes the same as the one the year before. During the following February I cut the two canes back to 3½ feet long, removed the stakes, and built a trellis over each row, in the following manner: I set 8-foot cedar posts half way between each vine, commencing with one set 4 feet from each end of the rows, and nailed to these posts white-pine strips full 1 inch thick by 4 inches wide, the first 1 foot from the ground, and the second 4 feet above that, from lower edge to upper edge: then nailed to these strips good white-pine laths, 9 inches apart. I then tied the two canes, on the two-arm system, to the lower bar; trained and tied the shoots from these canes to the trellis. Each shoot bore this year from three to four bunches of grapes: pinched each shoot off at from three to four leaves above the last bunch of grapes, and as it grew again, pinched it off at second leaf; and so on to top of trellis. When the clusters ripened, I was well repaid by the beautiful sight they presented. Both bunches and grapes were very large and perfectly formed. I readily sold the entire crop at 15 cents per pound on the vine. Some of the vines yielded 15 pounds each, and as beautiful and perfect as those grown under glass. My success attracted attention. Many enterprising farmers and citizens of Washington came to see my vineyard, and pronounced it the finest, as to growth of wood, foliage, and grapes, and as to training, trellis, &c., they had ever seen. The Concords surpassed all other varieties in all the desirable qualities. Having occasion, several weeks after my grapes had been disposed of, to visit central New York, I found many Concords grown there just in the market, but they were much inferior in point of perfect maturity, flavor, and sweetness. The crop of last season was the fifth I have grown, and was the largest; and although the average price realized was but about half that received for the first crop, it amounted to over $800 per acre, or about $700 net. I am annually enlarging my vineyard, which now comprises about six acres; expect to enlarge it to ten next fall. The soil and subsoil prove to be perfectly adapted to the growth of the grape, being composed of about equal parts of sand, loam, and clay, and containing considerable quantities of mica, with a subsoil of rotten rock, into which the grape-roots penetrate several feet. It is also just porous enough to absorb the rains; consequently no draining is required. In short, nature seems to have prepared this locality expressly for vineyards, as was plainly indicated by the spontaneous growth of so many wild vines. The extent of this natural vineyard-land is quite limited. It commences about one and a half miles above Georgetown and extends back from the Potomac say about one mile, but how far up the river is not known. While it is so well adapted to grape-growing, it proves equally good for all the small fruits—strawberries, blackberries, raspberries, &c.

SUCCESS OF SEEDS FROM THE DEPARTMENT.—Our correspondent in Troup County, Georgia, reports:

The Italian rye-grass sent by the Department of Agriculture is doing finely; sown the 8th of February, it will make good grazing now. The two quarts of spring barley, sown the 8th of February, is now in "the dough," averages about 3 feet in height, and will yield, I think, two or three bushels. The black-eye marrow-peas are fully 7 feet high, and we are eating peas from them daily; have never seen a variety do better in this section. The potato-oats will prove a failure. My black winter and yellow

rust-proof oats, sown side by side, the same day, will soon be ready for cutting, and are as fine as I ever saw in this section, while the potato-oats are about knee-high, and of a yellow, sickly appearance. The "Beeler upland" cotton is doing well. The silver-hull buckwheat is too young to tell much about it yet.

And our correspondent in Greenville County, South Carolina, reports, under date of June 5:

The "black-eyed marrow-pea," planted on the 15th of March, produced the first dish to-day. They are of excellent quality, well adapted to this climate; "5 feet high; strong and vigorous." The garden was manured from the barn-yard—plowed and harrowed in February—cultivated with a plow. The yield of peas is enormous.

CLOVER IN SOUTH CAROLINA.—Our correspondent in York County writes:

A few years ago clover was scarcely ever seen growing in this county, unless upon some small lot belonging to what the people called "a book-farmer;" now nearly every farmer grows from one-half of an acre to twenty acres. No machinery for threshing out the seed, that I am aware of, has thus far been brought here, and seed brought from northern markets is exclusively sown. In this county, on clay soil moderately fertile, clover has succeeded well; still, as yet, it is rarely planted as a crop, most farmers preferring to experiment on a small scale before seeding down with it any valuable portion of land. Its introduction here is a success, and its width will increase every year hereafter.

HARD TIMES IN ALABAMA.—Our correspondent in Franklin County writes:

Corn is scarce and high, commanding readily $1 per bushel. The farming interest is much depressed owing to the fall in cotton.

AGRICULTURAL ADVANTAGES AND DISCOURAGEMENTS IN FLORIDA.—Our correspondent in Wakulla County represents that in that section the people have become impoverished, lost all enterprise, "are deeply discouraged, and moving away." Plantations which, before the war, were among the most flourishing and famous, are now common grazing-grounds. And yet Wakulla County "lies contiguous to the Gulf, the sea-breezes are free and fresh, the climate is salubrious, and the soil productive." He concludes: "A full flood-tide of enlightened and energetic immigration is my only hope of immediate redemption."

ADVERSE SEASON IN NEW MEXICO.—Our correspondent in Mora County accompanies his statistical report for May and June with a statement which shows that the farmers in that Territory are passing through trying times at present. It is as follows:

You will see that the prospect is somewhat gloomy for the people of Mora County and from what I can learn it is not much better for all of the Territory. I have resided in this valley seventeen years, and in the Territory generally I have never seen so unfavorable a year for farmers and stock-raisers. My farm-book reports the fall of only about 8 inches of snow on the flat land during the winter; in fact, since September 6 of last year the ground has scarcely been moistened. The injury and loss among cattle and sheep are deplorable. The loss has been general, but individual cases of much greater loss than that reported are not unfrequent. I have heard of one gentleman who visited his ranch a short time back and found six hundred lambs already dropped by his ewes, and in scarcely ten days afterward his *mayordomo* wrote him that there were barely a hundred living, and his ewes dying at the rate of scores daily. Hunger and thirst are making sad havoc on the grazing-plains in every direction, for the spring-pasture is dried to the roots and the streams are so many dried gullies.

Many of the farmers residing at a distance of fifteen or twenty miles from the mountains have not planted a seed of any kind, and the probability is that two-thirds if not three-fourths of the farm-land in this county will lie idle this year.

AGRICULTURE IN ARKANSAS.—The following is a condensed statement of facts and views communicated by our correspondent in Garland (formerly Hot Springs) County. The soil in that section of the State, for the most part, is of a mineral cast. It yields not only vegetable products,

but hot and cold mineral waters, unexcelled in their medicinal properties, and silver, lead, zinc, copper, and iron ores. Garland County contains a mountain of stone which is believed to be the finest for whetstones in the country. The mineral and agricultural resources of the county are such that it only needs capital and enterprise to make it rank among the foremost in wealth and general prosperity. A part of the soil is barren, but the bottom-lands along the abounding rivers and creeks, and portions of the uplands, are unsurpassed in productiveness. With fair cultivation, the average yield per acre is about 1,800 pounds of cotton, 67 bushels of corn, and 28 bushels of wheat. The prevailing mode of farming is very defective. "They do not plow land in Arkansas, but only scratch it." A field of twelve acres, which, cultivated in the Arkansas style, had for the two previous years yielded only 22 bushels of corn per acre, was cultivated last year by a man from *Illinois*. He gave it a deep plowing and cross-plowing in December, 1872, and plowed it again on the 6th of February following. This was done with a strong yoke of oxen. He "laid off," covered the corn, and plowed between the rows twice, with a horse. The result of this more thorough cultivation was that he gathered 67½, instead of 22, bushels per acre, making a difference of 546 bushels—worth $1 per bushel.

There is a great need of a change for the better in farm stock. Horses are too light, hogs are of a very poor, thriftless breed, and cows, chiefly Texan cross-breeds, are generally poor milkers. There is yet greater need of improvement in care and keeping. Our correspondent bought four good-looking cows, raised in the county, at thirty dollars per head. They had averaged, for the first six months after calving, about 7 quarts of milk per day. He has a clover-field and grass-lots for them, supplies them with good water, salt, and shelter, and milks them at regular intervals. As a consequence they have increased to an average of 12 quarts per day for the same period—a gain of 5 gallons per day on the 4 cows. He paid for clover and grass seed, $14; for expenses in cultivating the same, $18. He sold clover and grass, in addition to what was consumed by the cows, to the amount of $31.75. He estimates his milk at sixty cents per gallon, (which seems a very high figure,) and at that rate the gain in six months, resulting from better care and feeding, would amount to $540—nearly all net gain, as the surplus clover and grass paid the expense of cultivating. There are now in the county only about forty-seven acres in clover and fifty in grass.

CROP-PROGNOSTICS.—The following notes are from communications by correspondents outside of our regular corps:

Saint Charles County, Missouri, May 10.—Our wheat is looking well; our oats could not look better. We are now planting corn. Potatoes—the Early Rose and Goodrich—are just up.

Fayette County, Texas, May 5.—Crops one month later than last year. The cold "norther" which commenced April 7 killed all the cotton and most of the corn and Irish potatoes.

Randolph County, Illinois, May 15.—Wheat looks exceedingly well, much better than at this time last year. Oats and grass also look well. Very little corn planted yet, and that mostly rotted in the ground; potatoes have also rotted—being visited by both the cut and army worm. Vegetation comes on more slowly than for many years. Will be no peaches, and very little other fruit.

Montgomery County, Kansas, May 10.—Spring cold and backward. Chinch-bug in the oats and spring-wheat. Winter-wheat looking very well.

Union County, South Carolina, May 14.—Wheat better than last year. More oats sown; season more favorable. Think the crop will be 25 per cent. better than the last. More barley sown; farmers are finding out that it will give them something green for stock sooner than anything else. Hardly as much corn planted as last year, but 10 per cent. more of cotton, and better stands of cotton now than at any time last year.

Northampton County, Pennsylvania, May 25.—We have had frosts nearly every night since the setting in of spring, retarding the growth of everything. The season has been very wet and late. Winter-wheat and rye look well, and promise a fine yield.

Osage County, Kansas, May 8.—Very backward spring; vegetation five to six weeks behind last spring. Wheat and oats, though backward, promise a heavy crop.

Dickinson County, Kansas, May 13.—We are now satisfied that, to insure a crop in this latitude and altitude, winter-wheat must be sown the last of August or the first week in September. Some of mine was sown on the 4th of September last and some after the 21st. The latter, though plowed in, was totally winter-killed, but the former, though harrowed in, from present appearances will yield 20 bushels per acre.

Columbia County, Wisconsin, May 10.—Winter-grain on old land looks bad; badly killed. It is better on new land, especially where shaded with belts of timber on the north and west sides.

Blanco County, Texas.—Grasshoppers have entirely destroyed the wheat-crop this spring in this and adjacent counties, but the people do not seem discouraged. Corn generally sells here at 50 cents per bushel; wheat at $1.50.

DESTRUCTION OF DESTRUCTIVE INSECTS.—Our correspondent in Gadsden County, Florida, under date of June 1, writes as follows:

During the present week I have received reports from three different sections of the county announcing the appearance of the dreaded caterpillar. These are doubtless sporadic cases, and furnish no basis upon which to predicate any ultimate result. While upon the subject I will state a fact, which is, at least, suggestive, and may lead to good results. Some years ago I was informed by Prince Murat (now deceased, but who then resided on his plantation located fourteen miles east of Tallahassee) that his crops of cotton had been for several successive years protected from the ravages of the caterpillar by the intervention of numerous flocks of the common "blackbird," which preyed voraciously upon these pests of the cotton-field. The secret of their advent to that locality he attributed to the fact that his negroes were in the habit of cultivating small patches of rice in the damp places, occurring in different portions of the plantation. As a confirmation of his statement, I will state a fact which came under my own observation during the past year. About the time that my corn had fully matured, the "grass-caterpillars" suddenly made their appearance in the fields, and were rapidly destroying the young grass, which we highly value for fall-pasturage. I observed at the same time that a large flock of domestic turkeys with their young came up of an evening with their craws very much distended. Suspecting the cause, I determined to watch them, and found to my great gratification that they were feasting upon the caterpillars. In the course of a day or two not a worm could be seen, and the pasturage was saved. These facts suggest the idea of introducing into the cotton-region the "English sparrow," which, I understand, has proven an effectual safeguard to the ornamental trees in the vicinity of many of the northern cities. From the reported habits and great fecundity of these birds, I entertain but little doubt that if extensively introduced, they would, in the course of a very few years, prove an effective antidote to the advent of this great enemy of the cotton-plant.

PROSPECTS FOR THE SEASON IN TENNESSEE.—Our correspondent in Macon County reported, May 1, that in that county wheat was thin on the ground, having been frozen out during the winter; cattle were in poor condition; pastures still bare, and vegetation generally at least one month later than usual. Our correspondent in Grundy makes a similar report. The spring has been extraordinarily cold and backward. Early grapes and most fruits have been killed by the frost; grass is backward, and cattle are on half-fare. Oats, and "what remained of winter-wheat and rye," are represented as doing well.

IMMIGRATION.—"Another influx of immigrants from Switzerland" is reported in Grundy County, Tenn., and "new farms rise up all around."

SEVERE FROSTS IN SOUTH CAROLINA.—Our correspondent in Fairfield County reports that, on the night of April 13, a more damaging frost occurred than has visited that section since 1849. The ground, where moist, was frozen to some depth. Corn that was large enough for the plow and hoe was killed below the surface. Wheat that had begun to develop heads was killed to the ground. Fruit was entirely destroyed. Peaches, as large as pigeon's eggs, "are as black as night." Cotton that was up was ruined, but owing to a drought of some six weeks, the most of the cotton-seed in the ground had not sprouted.

and, therefore, the frost has not materially affected the prospects for a cotton-crop.

Our correspondent in Greenville County also reports on the morning of April 26 the most destructive frost in that locality which has occurred within the memory of the living. Grape-vines that had grown "upwards of a foot" were killed outright. Indigenous varieties of grape-vines suffered the most. His own Scuppernongs are all destroyed for this year. The Concords stood it the best. He has never before known grape-fruit to be destroyed by frost in that county, though his remembrance extends back nearly fifty years. Cherries, plums, and strawberries, all nearly grown, were killed. Even blackberry and raspberry blossoms were smitten, though not all. Potato-tops, nearly six inches high, were cut down to the ground, and pease, radishes, and beets were killed absolutely. Forest-trees were blackened, the common maple being the only tree among the deciduous which escaped uninjured. Next to that in power of resisting the frost were the red elm, the beech, and the hickory, in the order named.

WEATHER AND CROP PROSPECTS IN VIRGINIA.—Our correspondent in King George County reports:

With the exception of the 8th and 9th, when the mercury rose to 82° and 87°, April was uniformly cold. There was, however, only one frost, on the 26th, and that, though sharp, did no harm. The mean temperature was 56°.2, about three degrees lower than last year. There were several light rains, and one heavy one on the 16th, when it fell all day. The aspen was in bloom on the 1st; the apricot on the 5th, when the first whip-poor-will was heard; the cherry and peach on the 6th; the plum and purple magnolia on the 8th; pyrus-japonica on the 9th; spirea and wild plum on the 10th; pears and red-bud on the 11th; spice-wood on the 12th; flowering-almond on the 13th; early apples on the 14th; lilac on the 15th; dogwood on the 21st; calicanthus on the 29th; and bird-cherry on the 30th—generally about ten days earlier than last year. The bloom of fruit is very full, and the indications are favorable for a plentiful yield.

Wheat has improved considerably, but bare and thin spots are visible, which must in some degree curtail the product, notwithstanding the favorable season. The Fultz wheat maintains its ascendency. Corn-planting began about the middle of April, and (May 1) is still in progress. The land is for the most part in good condition.

Rains have amounted to but little over half the average for twenty years, and were as follows: April 1st–2d, 0.025 inch; 9th, 0.16; 11th–12th, 0.135; 16th, 0.745; 20th–21st, 0.095; 23d, 0.10; 25th, 0.005; 28th, 0.29—total, 1.555 inch.

CAUSES OF HIGH PRICES OF LAND IN CALIFORNIA.—Our correspondent in San Joaquin County reports that the price of lands for farming and grazing has doubled since 1860, and is still increasing. And yet this advance in price he represents is neither a result of improvement in the land nor of increasing profits from agriculture, but rather of causes which greatly hinder agricultural prosperity: First, the greater and more valuable portion of what was the public domain is now held at high prices by speculators, who obtained it partly by direct purchase at the lowest rate, partly by "agricultural scrip, at 37½ cents per acre," and partly by the confirmation, through false testimony, of fraudulent or pretended Spanish grants; secondly, by a recent decision of the General Land-Office, what little of public land is left in the foothills and mountains is held to be mineral in character until proved to be more valuable for agricultural purposes, thus throwing the burden of proof upon the tiller of the soil. Our correspondent is decided in his opinion that it ought to be the other way, that the agriculturist has the primary claim upon the soil, and therefore all lands should be regarded as agricultural until proved to be more valuable for some other purpose. He further claims that while land-speculators and mining-speculators are apt to be strongly represented in Congress by parties indirectly if not directly interested, the Department of Agriculture is al-

most the only channel through which those who want land for the purpose of tilling it themselves can reach the ear of national legislation.

FARMING IN CALIFORNIA.—Our correspondent in San Joaquin County reports that in that section sheep-husbandry is the most profitable of all branches of agriculture. The wool will pay all expenses, two clips being obtained annually, each averaging from 2 to 7 pounds per head. The annual increase, which is from 70 to 100 per cent., is left for net profit. Stock-raising ranges next to sheep-husbandry in profit, or at least may be made to do so. On a ranch of 1,600 acres he keeps from 80 to 100 head of cattle. While his grain is growing they are confined in pasture. After that is harvested they run at large on the wheat and barley stubble till November. Then they are put in the dry pasture in which the straw has been housed, and on that they thrive until the rain brings grass again. With this treatment they are "good beef the year round." He adds, however, that "not one farmer in twenty-five pursues this course." On the adobe-land wheat-raising is very profitable. He has known wheat to be grown on such soil for twenty years in succession, without any apparent decrease of productiveness. The land is never plowed more than four, and more frequently not more than two, inches deep. The wheat is sown broadcast and harrowed in. He states that the raising of pork in California has been superseded by the introduction of pork raised in Missouri and Iowa over the Central and Union Pacific Railroads.

AGRICULTURAL IMPROVEMENTS AMONG THE INDIANS.—Under "the President's Indian policy," a superintendent and subagents, nominated at his request by the Society of Friends in the United States, were appointed over what are designated "the Indians of the Central Superintendency, under the care of Friends." The general agent of the executive committee of Friends on Indian affairs located at Lawrence, Kansas, makes a report covering the time of the President's first official term. It includes the condensed statistics, for the years 1868 and 1872, of the Kickapoos, Kaws, Osages, Quapaws, Peorias, Ottawas, Wyandotts, Senecas, Sacs and Foxes, Absentee Shawnees, Chippewas and Munsees, Cheyennes, Arapahoes, Wichitas, Keechies, Caddoes, Ionies, Kiowas, and Comanches. The following table indicates the industrial and general progress of these Indians for the years specified:

	1868.		1872.	
	Quantities.	Values.	Quantities.	Values.
Population	16,208	.....	17,957	.....
Number of schools	4	.....	14	.....
Number of pupils	105	.....	404	.....
Acres cultivated	3,220	.....	9,671	.....
Bushels of wheat raised	633	$1,135	3,247	$3,957
Bushels of corn	31,700	24,000	214,190	106,998
Bushels of oats	.....	.....	9,243	3,680
Bushels potatoes	1,770	1,770	15,201	7,414
Other vegetables	.....	.....	.....	7,355
Tons of hay	750	3,590	5,584	30,870
Number of horses owned	17,924	702,250	42,920	1,577,571
Number of cattle owned	640	15,200	6,604	103,804
Number of hogs owned	1,074	3,238	10,730	30,227
Total values	.....	750,581	.....	1,871,876

The report represents that each successive year, of the four covered by it, shows an increasing ratio of improvement. It also represents that with many of the Indians the means of industrial improvement came into their hands too recently for them to have more than begun farming operations, that most of the schools have been in existence too short a time for their legitimate results to be yet manifest, and that "several of these tribes have, since 1868, moved to new homes in the Indian Territory, and have, therefore, had to contend with all the retarding influences connected with the opening of farms, building houses, &c., in a wild and remote region." Yet, in spite of these drawbacks, their aggregate corn-crop for 1872 is about sevenfold greater than that of 1868, and the number of cattle and hogs owned by them about tenfold greater. In view of these facts, the agent predicts that, "should the same policy be pursued for the next four years, the improvement will be still more decided."

EXPERIMENTS IN FEEDIND HOGS.—Mr. John W. Zigler, of La Porte County, Indiana, reports the results of two experiments made by him in feeding hogs, as follows: Thirty-two hogs were fed twenty-six days in an 8-acre lot. They consumed 193 bushels of unshelled old corn, 70 pounds to the bushel. Their aggregate weight at the beginning of the period was 6,420 pounds; at the end, 8,750 pounds; gain, 2,330 pounds. When he commenced feeding the hogs were worth 3½ cents per pound, amounting to $224.70; after feeding, 3.8 cents per pound, amounting to $332.50; gain, $107.80. The 193 bushels of corn, at 35 cents per bushel, cost $67.55; net profit on the corn, $40.25. Every 4⅘ pounds of (shelled) corn made one pound of pork. A live hog, weighing 428 pounds, lost by bleeding, 7 pounds; by both bleeding and dressing, 58 pounds, or a little over one-seventh of the live-weight.

Mr. Zigler also fed to 15 hogs, on the floor in pen, 100 bushels, by weight, of old shelled corn, in forty-two days. The aggregate weight of the hogs at the beginning of the experiment was 2,490 pounds; at the end, 4,260 pounds, a gain of 1,770 pounds, or 2⅘ pounds per day on hogs averaging at the commencement 166 pounds. In this experiment 3 pounds of corn made one of pork, in the other 4⅘ pounds. In the latter case the pork was sold for 10½ cents per pound.

Mr. E. Hersey, our correspondent for Plymouth County, Massachusetts, made the following experiment with a special view to ascertain at what size the gain was greatest in proportion to the amount of feed. Two pigs, six weeks old, weighing 30 pounds each, cost, $6; they consumed 33½ bushels of Indian meal, 78 cents per bushel, $26.13; 6 bushels of fine feed, 30 cents per bushel, $1.80; 12 bushels of potatoes, 25 cents per bushel, $3; cost of dressing, $2; total, $38.93. They were slaughtered when eight months old, and made 494 pounds of pork, which was sold at 8 cents per pound, amounting to $39.52; profit, 59 cents. The feed was measured and the pigs weighed daily until they reached 100 pounds each; after that they were weighed once in a week. It was found that the increase of pork cost the least per pound, namely, 4 cents, live weight, when the pigs weighed about 100 pounds each, and the most when they were at their greatest weight.

UNUSUAL CATTLE-DISEASE.—Senator Hitchcock has transmitted to this Department an account of a cattle disease, hitherto unknown in Nebraska, which appeared in Dodge County early in April. The essential facts are as follows:

The herd in which it first appeared consisted of about 150 two year old heifers and steers, chiefly Cherokee stock, with which an equal num-

ber of hogs were yarded. The inclosure in which the three hundred animals are kept contains about two acres; is dry, sufficiently sheltered, and well supplied with fresh water, and with troughs for feeding. The feed was corn in the husk and all the hay they would eat. The disease, which is limited to heifers, or cows, (both the barren and those with calf,) first shows itself in a spot, having "the appearance of dead flesh by reason of freezing," on the lowest external point of the vaginal orifice. From thence a species of ulceration gradually extends to the mouth of the womb, the lining of the vagina being covered with numerous small pimples. The eyes of the animal affected remain bright, her appetite good, and there are no other indications of disease apparent until she begins a violent switching of the tail. This is followed by nervous jerkings of the body, bellowings which are fierce and piteous by turns, biting the legs and hips, often so desperately as to tear out masses of flesh, wildness in the eyes, and a special madness toward humankind. In thirty-six to forty-eight hours from the time the spot first appears, and in twelve to fifteen from the time the switching of the tail begins, death ensues. Within a week from the time the first symptom of the disease was noticed, 28 of the Cherokee heifers and 3 of the native stock had died. Post-mortem examination failed to discover any abnormal condition beyond the vagina, except that the small intestines and parts about "the small of the back" showed some inflamation. The flesh of those that died was eaten by hogs and dogs with impunity. After trying almost every known prescription for cattle-diseases without avail, syringing the vagina "with coal-oil, or lard-oil, which is better," was found to be "a sure cure if taken in time;" that is to say all were saved to which this remedy was applied before the violent switching of the tail began, but none were saved to which it was not applied before the disease had reached that stage. In about six hours after the first injection of the oil, the pimples in the vagina begin to disappear. Up to April 30, 44 cases had terminated fatally. Whether all belonged to the herd in which the disease first appeared is not stated.

WEATHER AND COTTON IN MISSISSIPPI.—Our correspondent in Clark County writes:

> We have had the coldest April known for many years. Stand of cotton very bad and no seed to replant with. Depth of rain in April, 2.65 inches.

AUSTRALIAN EUCALYPTUS.—Our correspondent in Galveston County, Texas, to whom this Department had forwarded seeds of the Eucalyptus from Australia for trial in that section, reports favorable results thus far. The part of the seeds he retained were planted on Galveston Island, the surface of which is perfectly flat, with a light, sandy soil. In just fifteen months after the seeds were planted he had a fine lot of young trees of thrifty, rapid growth, and uninjured by the weather of last winter, which was unusually severe for that section. Several of the trees from the seed of the *Eucalyptus globulus* had attained a height of over 8 feet. Others with whom he shared the seeds have experimented, at different points on the mainland, with similar results, and much confidence is now felt in the ultimate success of growing the Eucalyptus in the Gulf counties.

MARKET PRICES OF FARM PRODUCTS.

MAY AND JUNE, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.

Articles.	May.	June.
NEW YORK.		
Flour, superfine State ..... per barrel..	$5 75 to $6 35	$5 65 to $6 15
extra State ..... do.....	7 00 to 8 25	6 75 to 8 15
superfine western ..... do.....	5 80 to 6 25	5 60 to 6 10
extra to choice western ..... do.....	7 00 to 12 50	6 50 to 10 30
southern ship'g, com. to choice.. do.....	6 00 to 8 25	6 25 to 8 10
southern family, ord'y to choice.. do.....	8 15 to 12 50	8 25 to 11 50
Wheat, No. 1 spring ..... per bushel..	1 75 to 1 78	1 66 to 1 69
No. 2 spring ..... do.....	1 52 to 1 67	1 55 to 1 61
winter, red, western ..... do.....	1 80 to 1 95	1 70 to 1 95
winter, amber, western ..... do.....	1 95 to 2 05	1 70 to 1 95
winter, white, western ..... do.....	1 95 to 2 35	1 90 to 2 10
Rye ..... do.....	98 to 1 00	96½ to 97
Barley ..... do.....	90 to ———	——— to 1 10
Corn ..... do.....	68 to 71½	61 to 67
Oats ..... do.....	49 to 54	48 to 58½
Hay, first quality ..... per ton...	26 00 to 28 00	26 00 to 28 00
second quality ..... do.....	23 00 to 25 00	22 00 to 24 00
Pork, mess ..... per barrel..	19 00 to ———	16 37½ to ———
extra prime ..... do.....	18 00 to ———	14 00 to ———
prime mess ..... do.....	18 00 to 18 50	17 00 to 17 50
Lard ..... per pound..	09¼ to 09⅝	08½ to 9 1/16
Beef, plain mess ..... per barrel..	9 00 to 11 75	9 00 to 11 50
extra ..... do.....	12 00 to 13 50	11 25 to 13 00
Butter, western ..... per pound..	32 to 35	18 to 24
State dairy ..... do.....	35 to 39	24 to 29
Cheese, western factory ..... do.....	10 to 14½	11 to 14
State factory ..... do.....	12 to 16	12 to 15½
Cotton, ordinary to good ordinary.... do.....	15 to 16⅝	14½ to 16½
low middling to good middl'g.. do.....	18⅜ to 22⅝	18¼ to 22
Tobacco, lugs, all grades ..... do.....	07 to 08½	07 to 08½
common to medium leaf..... do.....	08½ to 10½	08½ to 10½
Wool, American Saxony fleece..... do.....	48 to 55	48 to 55
American merino, full blood .... do.....	48 to 54	48 to 54
American, combing ..... do.....	58 to 63	58 to 63
pulled ..... do.....	28 to 48	28 to 56
California, spring clip, unwash'd.. do.....	21 to 31	20 to 31
California, fall clip, unwashed.. do.....	19 to 24	17 to 24
Texas ..... do.....	20 to 32	17 to 32
BOSTON.		
Flour, western, superfine ..... per barrel..	5 50 to 6 00	5 50 to 6 25
western extras ..... do.....	6 75 to 9 00	6 75 to 9 00
western choice ..... do.....	9 50 to 11 50	9 50 to 12 00
southern extras ..... do.....	6 75 to 7 25	7 00 to 7 50
choice Baltimore ..... do.....	10 00 to 12 00	10 00 to 12 00
Wheat ..... per bushel..	1 60 to 2 00	1 60 to 2 00
Rye ..... do.....	95 to 1 00	1 00 to 1 05
Barley ..... do.....	90 to 1 20	90 to 1 20
Oats ..... do.....	49 to 59	48 to 50
Corn, southern yellow ..... do.....	73 to 74	70 to 71
western yellow ..... do.....	73 to 74½	70 to 71
Hay, eastern and northern..... per ton..	16 00 to 28 00	15 00 to 28 00

Market prices of farm products—Continued.

Articles.	May.			June.		
BOSTON—Continued.						
Beef, western mess ..... per barrel..	$12 00	to	$12 50	$12 00	to	$12 50
western extra ..... do.....	13 00	to	14 00	12 00	to	12 50
Pork, prime ..... do.....	15 00	to	15 50	14 00	to	14 50
mess ..... do.....	19 50	to	20 00	17 00	to	18 00
Lard ..... per pound..	09¾	to	10¼	09¼	to	09¾
Butter, N. Y. and Vt. fair to choice new.. do.....	35	to	40	23	to	29
western, good to choice new.. do.....	35	to	38	25	to	27
Cheese, N. Y. and Vt., factory ..... do.....	11	to	16	10	to	14½
New York and Vermont dairy.. do.....	10	to	15	———	to	———
Ohio factory, good to choice.... do.....	12	to	15½	12	to	14
Cotton, ordinary to good ordinary.... do.....	13½	to	17½	12	to	17
low middling to good middling do.....	18¾	to	22	18¼	to	22
Tobacco, lugs ..... do.....	8½	to	10	7½	to	09
common to medium leaf .... do.....	09½	to	10½	09	to	10½
Wool, Ohio and Pennsylvania..... do.....	45	to	58	45	to	60
Michigan ..... do.....	42	to	50	42	to	50
other western..... do.....	40	to	49	40	to	49
pulled ..... do.....	20	to	50	20	to	55
combing-fleece ..... do.....	60	to	65	60	to	65
California..... do.....	18	to	35	17	to	35
Texas..... do.....	18	to	30	18	to	30
PHILADELPHIA.						
Flour, superfine ..... per barrel..	5 00	to	5 25	4 75	to	5 50
Pennsylvania extra ..... do.....	6 50	to	———	5 75	to	6 50
Pennsylvania family..... do.....	8 00	to	9 00	7 87½	to	8 75
western family ..... do.....	7 75	to	9 00	8 00	to	8 75
western fancy ..... do	9 50	to	11 00	8 50	to	10 50
Wheat, winter, red, western..... per bushel..	1 92	to	2 00	1 88	to	1 97
winter, amber, western..... do.....	1 97	to	2 05	1 95	to	2 00
winter, white, western..... do.....	2 00	to	2 16	2 10	to	2 15
spring ..... do.....	1 58	to	1 97	1 60	to	1 85
Rye ..... do.....	95	to	———	87	to	88
Barley..... do.....	1 20	to	———			nominal.
Oats, western, mixed..... do.....	47	to	49	45	to	48
western, white..... do.....	51	to	52	48	to	51½
Corn, yellow..... do.....	62	to	66	61½	to	65
white ..... do.....	65	to	66	65	to	67
Hay, fresh, bale..... per ton..	30 00	to	35 00	30 00	to	35 00
common to fair shipping ..... do.....	25 00	to	30 00	25 00	to	30 00
Pork, mess..... per barrel..	19 00	to	19 50	18 00	to	18 37½
prime extra ..... do.....	15 25	to	15 50	17 00	to	17 25
Beef, western mess ..... do.....	8 00	to	10 00	8 00	to	10 00
extra mess ..... do.....	10 00	to	12 00	10 00	to	12 00
Warthman's city family..... do.....	16 00	to	———	16 00	to	———
Lard ..... per pound..	9½	to	12	9¼	to	12
Butter, choice..... do.....	37	to	38	26	to	28
good ..... do.....	30	to	35	22	to	25
Cheese, New York factory..... do.....	14½	to	15¼	15	to	15½
Ohio factory..... do.....	11	to	13	15	to	———
Cotton, ordinary to good ordinary.... do.....	14⅝	to	17⅝	14	to	17
low middling to good middling..do.....	18¼	to	21¾	17	to	21½
Wool, Ohio X and XX ..... do.....	51	to	52	52	to	53
Ohio combing..... do.....	65	to	67½	56	to	———
Virginia fine and X..... do.....	52	to	———	———	to	———
Indiana tub-washed..... do.....	46	to	55	52½	to	———
unwashed ..... do.....	20	to	35	31½	to	———
pulled..... do.....	42	to	45	42	to	45

Market prices of farm products—Continued.

Articles.	May.	June.
BALTIMORE.		
Flour, superfine ..... per barrel..	$5 00 to $8 00	$5 00 to $8 00
extra ..... do.....	6 25 to 9 50	6 50 to 9 75
family and fancy ..... do.....	8 00 to 11 50	8 00 to 11 50
Wheat, white, fair to choice ..... per bushel..	1 85 to 2 10	1 85 to 2 15
amber, choice ..... do.....	2 00 to 2 05	2 05 to 2 10
red, common to prime ..... do.....	1 65 to 1 98	1 50 to 2 00
red, western ..... do.....	1 71 to 1 90	1 80 to 1 90
Rye, common to prime ..... do.....	90 to 1 00	90 to 95
Corn, yellow, southern ..... do.....	64 to ———	62 to 63
white, southern ..... do.....	67 to 68	71 to 72
mixed, western ..... do.....	64 to ———	63 to ———
Oats, southern ..... do.....	50 to 53	51 to 54
western ..... do.....	49 to 52	48 to 52
Hay, western, good ..... per ton...	26 00 to 30 00	26 00 to 30 00
Pork, mess ..... per barrel..	18 50 to 19 00	18 00 to ———
Beef, Baltimore mess ..... do.....	15 00 to 20 00	15 00 to 20 00
extra ..... do.....	23 00 to 25 00	23 00 to 25 00
Lard ..... per pound..	9½ to 10½	9½ to 10
Butter, New York ..... do.....	25 to 28	28 to 30
choice, western ..... do.....	25 to 28	— to 28
good to prime western ..... do.....	20 to 25	20 to 22
Cheese, eastern, jobbing lots ..... do.....	16½ to 17	15 to 15½
western ..... do.....	13 to 15	13½ to 14½
Cotton, ordinary to good ordinary .... do.....	13 to 16	13 to 16½
low middling to middling ..... do.....	18¼ to 19¼	18 to 19½
Tobacco, lugs, ... per cental..	7 50 to 9 50	7 50 to 9 50
common to medium leaf ..... do.....	8 50 to 11 00	8 50 to 11 00
Wool, fleece, washed, com. to fine ... per pound..	45 to 50	——— to ———
tub-washed ..... do.....	40 to 45	40 to 45
unwashed ..... do.....	25 to 30	25 to 33
pulled ..... do.....	30 to 37	30 to 37
CINCINNATI.		
Flour, superfine ..... per barrel..	5 25 to 6 00	5 50 to 6 00
extra ..... do.....	7 00 to 7 60	7 15 to 7 60
family and fancy ..... do.....	8 00 to 9 25	7 60 to 9 25
Wheat, red winter, No. 1 ..... per bushel..	1 76 to 1 78	1 65 to ———
red winter, No. 2 ..... do.....	1 70 to 1 72	1 55 to 1 60
hill ..... do.....	——— to 1 86	1 70 to ———
white winter ..... do.....	——— to 1 95	1 75 to ———
Rye ..... do.....	83 to 85	78 to 80
Barley ..... do.....	75 to 1 10	70 to 1 00
Corn ..... do.....	48 to 50	47 to 50
Oats ..... do.....	44 to 45	38 to 45
Hay, baled, No. 1 ..... per ton.....	19 00 to 23 00	18 00 to 19 00
lower grades ..... do.....	15 00 to 18 00	15 00 to 17 00
Beef, plate ..... per barrel..	13 00 to 14 00	13 50 to 14 00
Pork, mess ..... do.....	18 00 to 18 50	16 00 to 16 75
Lard ..... per pound..	8½ to 9½	8½ to 9
Butter, choice ..... do.....	30 to 33	20 to 22
good to prime ..... do.....	25 to 27	15 to 17
Cheese, factory ..... do.....	12½ to 13½	12 to 13
pine-apple ..... do.....	22 to ———	——— to ———
Cotton, ordinary to good ordinary .... do.....	12 to 15½	12 to 15
low middling to good middl'g do.....	17½ to 19¾	17½ to 19½
Wool, common to medium washed ... do.....	35 to ———	35 to ———
medium to fine washed ..... do.....	——— to 40	——— to 40
tub-washed ..... do.....	40 to 43	40 to 43
unwashed, clothing ..... do.....	25 to 27	25 to 27
unwashed, combing ..... do.....	30 to 35	30 to 35
pulled ..... do.....	33 to 35	33 to 35

Market prices of farm products—Continued.

Articles.	May.	June.
CHICAGO.		
Flour, white win'r, ex., f'r to choice, per barrel	$8 00 to $10 50	$8 50 to $11 00
red winter, extra, do	7 00 to 8 50	7 00 to 8 50
good to choice spring, extra, do	6 00 to 6 75	6 25 to 7 50
spring, superfine, do	2 90 to 4 75	3 00 to 5 00
good to fancy Minnesota, do	6 50 to 8 00	6 50 to 8 50
Wheat, No. 1 spring, per bushel	—— to ——	1 35 to 1 35½
No. 2 spring, do	1 23¾ to 1 25	1 30 to ——
No. 3 spring, do	1 15 to 1 15½	1 19 to 1 20
Rye, No. 2, do	69 to 69½	68½ to ——
Barley, No. 2, do	71½ to 81	70 to 78
Corn, No. 2, do	30⅝ to 31½	38¼ to 39½
Oats, No. 2, do	37½ to 38⅜	32¼ to 32⅝
Hay, timothy, per ton	15 00 to 17 00	15 50 to 17 50
prairie, do	12 00 to 17 00	12 00 to 16 00
Pork, mess, per barrel	18 00 to 18 05	16 15 to 16 20
Beef, mess, do	9 00 to 9 25	9 00 to 9 25
extra mess, do	10 00 to 10 25	10 00 to 10 25
Lard, per cental	9 05 to 9 10	8 50 to ——
Butter, strictly choice, per pound	32 to 35	23 to 25
common to choice roll, do	24 to 30	—— to ——
Cheese, New York factory, do	15 to 16	12½ to 13½
Elgin factory, do	—— to ——	12½ to 13½
Ohio factory, do	13 to 14	11 to 12½
western factory, do	12 to 14	11 to 12½
Wool, tub-washed, do	45 to 55	45 to 52
fleece-washed, do	37 to 47	37 to 45
unwashed, do	27 to 33	27 to 30
pulled, do	38 to 43	38 to 44
SAINT LOUIS.		
Flour, winter, superfine, per barrel	3 50 to 5 35	3 00 to 4 00
winter, extras, do	6 25 to 7 50	5 75 to 7 00
winter, choice and family, do	8 00 to 9 25	8 00 to 8 87½
Wheat, red winter, No. 1, per bushel	1 72 to 1 80	1 65 to 1 72
red winter, No. 2, do	1 70 to 1 78	1 60 to 1 65
spring, No. 2, do	1 25 to 1 30	1 30 to ——
Rye, No. 2, do	68 to ——	65 to 70
Barley, do	90 to 1 00	65 to 70
Corn, do	37½ to 46½	37 to 48
Oats, do	31 to 33	32 to 42½
Hay, shipping and choice timothy, per ton	16 00 to ——	17 50 to 20 00
prime, do	13 50 to ——	17 50 to ——
Pork, mess, per barrel	18 50 to ——	16 75 to 17 50
Beef, mess, do	14 00 to ——	14 00 to ——
Lard, per pound	7⅜ to 10½	7½ to 9
Butter, prime to strictly choice, do	—— to ——	19 to 22
choice packed, do	26 to 30	15 to 18
Cheese, factory, do	14 to 15½	—— to ——
Cotton, middling, do	18¼ to 18⅜	18 to 18¼
Wool, tub-washed, do	43 to 50	42 to 47
fleece, washed, do	—— to ——	38 to 45
unwashed, clothing, do	25 to 30	—— to ——
unwashed, combing, do	35 to ——	32 to 35
Tobacco, lugs, per cental	—— to ——	4 00 to 6 00
common to medium leaf, do	—— to ——	6 25 to 8 00
NEW ORLEANS.		
Flour, superfine, per barrel	5 50 to ——	5 50 to 5 75
extras, do	5 75 to 8 25	6 00 to 7 75
choice, do	8 50 to 10 00	8 25 to 9 50
Corn, white, per bushel	57 to 59	57 to 58
yellow, do	57 to 58	57 to ——

Market prices of farm products—Continued.

Articles.	May.	June.
NEW ORLEANS—Continued.		
Oats ..... do	$0 43 to $0 44	$0 45 to $0 46
Hay, choice ..... per ton	27 00 to 28 00	25 00 to ———
prime ..... do	23 00 to 25 00	21 00 to 25 00
Pork, mess ..... per barrel	18 50 to 19 00	17 25 to 17 50
extra prime ..... do	——— to ———	——— to ———
Beef, Texas ..... do	11 00 to 12 00	11 00 to ———
western ..... do	14 00 to 15 00	14 00 to 15 00
Lard ..... per pound	8¾ to 10¾	9½ to 10½
Butter, choice western ..... do	40 to 45	26 to 28
choice Goshen ..... do	50 to ———	36 to 38
Cheese, choice factory ..... do	13 to ———	12 to 14
New York cream ..... do	18 to 19	——— to ———
Cotton, ordinary to good ordinary ..... do	12⅜ to 15⅜	12 to 16
low middling to good middling .. do	17¼ to 20	16⅞ to 19⅜
Tobacco, lugs ..... do	8 to 8½	7½ to 9
low-leaf ..... do	9 to 9½	9 to 10
medium-leaf ..... do	10 to 10¾	10 to 11
Wool, lake ..... do	25 to 26	30 to ———
Louisiana, clean ..... do	20 to ———	28 to ———
SAN FRANCISCO.		
Flour, superfine ..... per barrel	5 00 to ———	4 50 to 5 25
extra ..... do	5 25 to 5 50	5 25 to 5 50
higher grades ..... do	——— to ———	5 75 to 6 00
Wheat, State ..... per cental	1 75 to 1 90	1 85 to 1 90
Oregon ..... do	1 75 to 1 85	1 85 to 1 90
Barley ..... do	1 15 to 1 40	1 25 to 1 50
Oats ..... do	2 15 to 2 35	1 35 to 2 10
Corn, white ..... do	1 15 to ———	1 25 to 1 30
yellow ..... do	1 12½ to 1 15	1 25 to 1 30
Hay, State ..... per ton	21 00 to ———	10 00 to 21 00
Pork, mess ..... per barrel	19 00 to 19 50	18 00 to 18 50
prime mess ..... do	18 50 to ———	17 00 to 17 50
Beef, mess ..... do	10 00 to 12 00	10 00 to 12 00
Lard ..... per pound	10¼ to 12½	10½ to 12
Butter, overland ..... do	15 to 20	15 to 18
California ..... do	25 to 30	25 to 32½
Oregon ..... do	15 to 18	15 to 18
Cheese ..... do	12 to 16	12 to 14
Wool, native ..... do	11 to 14	12 to 15
California ..... do	18 to 22	18 to 22
Oregon ..... do	18 to 22	18 to 22

LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, choice steers ..... per cental	$13 00 to ———	——— to ———
second picks ..... do	12 50 to ———	——— to ———
general range of native cattle .. do	11 00 to $12 00	$11 00 to $12 50
Texans and Cherokees, dressing from 55 to 56 pounds ..... per cental	10 50 to 11 00	——— to ———
Sheep, shorn ..... do	4 50 to 6 25	5 50 to 6 62½
unshorn ..... do	6 00 to 7 00	——— to ———
spring lambs ..... do	7 00 to 8 50	10 00 to 14 00
Hogs, good, corn-fed ..... do	6 00 to ———	7 00 to 7 25

Live stock markets—Continued.

	May.			June.		
BOSTON.						
Cattle, choice, live weight.....per cental..	$10 50	to	$11 00	$7 50	to	$7 75
extra, live weight .....do.....	9 50	to	10 25	7 00	to	7 25
first quality, live weight.....do.....	8 00	to	9 00	6 37	to	6 62
second quality, live weight....do.....	6 00	to	7 50	5 25	to	6 00
third quality, live weight ....do.....	5 00	to	5 50	4 50	to	5 00
working-oxen.....per pair..	100 00	to	275 00	100 00	to	275 00
milch cows with calves.....per head..	35 00	to	60 00	35 00	to	60 00
milch cows, extra.....do.....	65 00	to	87 00	65 00	to	90 00
farrow cows.....do.....	15 00	to	40 00	15 00	to	40 00
yearlings .....do.....	10 00	to	18 00	10 00	to	18 00
two-year-olds .....do.....	19 00	to	28 00	19 00	to	28 00
three-year-olds.....do.....	30 00	to	45 00	30 00	to	45 00
veal calves.....do.....	4 00	to	13 00	3 00	to	10 00
Sheep, in lots .....do.....	3 50	to	4 50	3 00	to	4 50
Hogs, western, fat.....per cental..	6 25	to	6 50	6 00	to	6 25
PHILADELPHIA.						
Cattle, common to good beeves ...per cental..	5 00	to	7 00	4 00	to	———
extra to choice .....do.....	7 25	to	8 50	———	to	8 00
Sheep, fair to choice wooled.....do.....	7 00	to	8 00	———	to	———
clipped .....do.....	4 50	to	6 50	5 00	to	6 25
Hogs, corn-fed .....do.....	8 50	to	8 75	8 00	to	8 25
slop-fed .....do.....	7 50	to	8 00	7 00	to	7 50
BALTIMORE.						
Cattle, best beeves.....per cental..	6 25	to	7 25	6 12	to	7 12
first quality.....do.....	5 50	to	6 25	5 37	to	6 12
medium, or good fair quality..do.....	5 00	to	5 50	5 00	to	5 37
general average .....do.....	6 25	to	———	6 00	to	———
general range of sales.....do.....	5 75	to	6 75	4 50	to	7 12
Sheep, wooled.....do.....	6 00	to	7 00	———	to	———
clipped .....do.....	4 50	to	6 75	———	to	———
fair to good .....do.....	———	to	———	4 50	to	6 25
good to extra .....do.....	———	to	———	6 00	to	6 50
Hogs, corn-fed .....do.....	7 50	to	8 25	7 50	to	7 75
still-fed, net.....do.....	7 25	to	7 75	7 00	to	7 25
CINCINNATI.						
Cattle, fair to prime shipping.....per cental..	5 50	to	6 00	5 00	to	5 75
Sheep, good to choice.....do.....	5 00	to	7 00	4 50	to	6 50
common to fair.....do.....	4 00	to	5 00	3 50	to	4 50
lambs .....per head..	———	to	———	3 50	to	6 00
Hogs, choice.....per cental..	5 90	to	6 00	———	to	5 25
CHICAGO.						
Cattle, extra graded steers, 1,400 pounds and upward.....per cental...	5 90	to	6 15	5 80	to	6 10
choice beeves, fine, fat, well-formed, 3 to 5 years old, 1,300 to 1,450 pounds.....per cental..	5 50	to	5 70	5 50	to	5 70
good beeves, well-fattened, finely formed steers, 1,200 to 1,300 pounds, per cental..	5 10	to	5 35	5 25	to	5 40
medium grades, steers fair in flesh, 1,100 to 1,250 pounds...per cental..	4 80	to	5 00	4 80	to	5 15
butchers' stock, common to fair steers and good to extra cows, 800 to 1,100 pounds.....per cental..	4 00	to	5 00	4 00	to	5 25

Live Stock Market—Continued.

	May.			June.		
CHICAGO—Continued.						
Cattle, stock cattle, 700 to 1,080 pounds per cental	$3 85	to	$4 90	$3 75	to	$4 90
inferior do	3 00	to	4 00	3 00	to	3 75
Texans, north-wintered do	4 00	to	4 50	4 00	to	4 50
Texans, corn-fed do	4 65	to	5 00	4 65	to	5 25
Hogs, good to choice do	5 25	to	5 30	4 85	to	4 90
Sheep, poor to choice do	4 00	to	6 50	——		——
SAINT LOUIS.						
Horses, driving animals, good to extra, per head	100	to	200	100	to	225
common to fair do	90	to	125	85	to	110
draught animals, heavy to extra heavy, per head	125	to	225	120	to	220
Mules, good heavy animals do	135	to	175	125	to	165
extra do	200		——	200		——
Cattle, choice native-blood steers, 1,300 to 1,600 pounds per cental	6 00	to	6 50	5 75	to	6 00
prime second-class, 1,150 to 1,400 pounds per cental	5 50	to	6 00	5 25	to	5 75
good third-rate native-blood, 1,050 to 1,300 pounds per cental	4 50	to	5 00	4 50	to	5 00
fair butchers' steers, 1,000 to 1,200 pounds per cental	4 00	to	4 50	4 50	to	4 70
thrifty stock steers, 900 to 1,300 pounds per cental	4 00	to	4 50	4 50	to	5 00
inferior do	2 00	to	4 00	2 50	to	4 50
good to choice corn-fattened Texans, per cental	3 50	to	5 50	4 50	to	5 00
veal calves per head	6 00	to	10 00	7 00	to	10 00
milch cows with calves do	25 00	to	60 00	25 00	to	60 00
Sheep, extra mutton grades per cental	6 50	to	6 75	5 50	to	6 50
common to good do	3 50	to	5 75	4 50	to	5 00
Hogs, extra grades, gross weight do	5 30	to	5 35	4 65	to	4 70
fair to good do	5 10	to	5 25	4 55	to	4 60
common to medium do	4 95	to	5 00	4 35	to	4 40
NEW ORLEANS.						
Cattle, choice Texas beeves per head	50 00		——	50 00		——
first quality do	35 00	to	45 00	35 00	to	45 00
second quality do	20 00	to	28 00	20 00	to	25 00
third quality do	15 00	to	18 00	15 00	to	18 00
Western beeves, net per cental	10 00	to	12 50	10 00	to	12 50
milch cows, choice per head	80 00	to	100 00	80 00	to	100 00
milch cows do	35 00	to	50 00	35 00	to	50 00
calves do	8 00	to	12 00	8 00	to	12 00
yearlings do	10 00	to	14 00	10 00	to	14 00
Sheep, first quality do	5 00	to	6 00	5 00	to	6 00
second quality do	3 00	to	4 05	3 00	to	4 05
third quality do	2 00	to	2 10	2 00	to	2 10
Hogs, gross per cental	6 00	to	7 00	6 00	to	7 00

FOREIGN MARKETS.

WHEAT.—The month of April opened, in the London market, with moderate stocks of English wheat but with good supplies of foreign, one-half of which were American. The foreign trade, however, was

limited, and the floating-cargo trade in favor of buyers. The weather during the first and third weeks was favorable for wheat growth and quite the reverse during the alternate weeks. During the first week the London averages were 55*s.* 3*d.* on 2,041 quarters, and during the fourth week 55*s.* 1*d.* on 3,696 quarters. The imports of wheat into the United Kingdom during the four weeks ending April 26 amounted to 2,168,664, the import trade showing a very great decline in the last week. The interior markets of England about the close of the month manifested an increased activity in the wheat-trade, the advance of prices averaging about a shilling per quarter. The decreased import caused a firmer feeling in foreign grain in the London markets, but as the weather began to clear up and the prospect of home crops to brighten, the tone of the market became less buoyant and confident. The wheat-trade of Paris, which at the first of the month showed a tendency to higher prices, settled down quietly to a steady range. Prices were steady also at Marseilles, but rose with fine weather at the close of the month. The month closed at Odessa with moderate supplies at full rates.

At Liverpool, American white wheat ranged from 13*s.* to 14*s.* per cental; red winter and southern, 12*s.* to 12*s.* 6*d.*; spring No. 1, 11*s.* 10*d.* to 12*s.* 6*d.*; spring No. 2, 11*s.* 3*d.* to 11*s.* 10*d.*; Canadian white, 11*s.* 8*d.* to 13*s.*; Canadian red, 12*s.* to 12*s.* 6*d.*; California white, 11*s.* 4*d.* to 12*s.* 3*d.*; Chilian white, 11*s.* 4*d.* to 11*s.* 9*d.*; French white, 12*s.* 6*d.*; French red, 11*s.* 7*d.* to 12*s.* 1*d.*; Spanish, 12*s.* to 12*s.* 2*d.*; Danubian, 7*s.* to 9*s.*

FLOUR.—The standing flour quotations of the London market were as follows: Best town households, per sack of 280 pounds, 47*s.* to 54*s.*; best country households, 44*s.* to 47*s.*; Norfolk and Suffolk, 38*s.* to 42*s.* In Liverpool, English and Irish superfines ranged from 40*s.* to 42*s.* per 280 pounds; extras, 43*s.* to 51*s*; French, 48*s.* to 53*s.* 6*d.*; Spanish, 47*s.* to 47*s.* 6*d.*; Trieste and Hungarian, 64*s.* to 76*s.*; Chilian and Californian, 42*s.* to 48*s.*; American, per barrel of 196 pounds, western, 28*s.* 6*d.* to 31*s.*; extra, 30*s.* to 34*s.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.* The Paris market from a state of steadiness gradually rose, the later quotations being 44*s.* 2*d.* to 48*s.* 8*d.* per 280 pounds.

INDIAN CORN.—In Mark Lane, London, the regular quotations for Indian corn were the same as in our April report, 31*s.* to 33*s.* per quarter for white; yellow, 26*s.* to 28*s.* In Liverpool, at the close of the month, American white brought from 30*s.* to 31*s.*; yellow, 27*s.* 6*d.* to 28*s.*; Trieste, 27*s.* 6*d.* to 28*s.*; Danubian, 27*s.* 6*d.* to 29*s.*; Galatz, 28*s.* 6*d.* to 29*s.* 6*d.*

WOOL.—English wool was steady in price, Southdown hoggets ranging, at the close of the month, from 1*s.* 10*d.* to 1*s.* 11*d.* per pound; Kent fleeces, 1*s.* 10*d.* to 1*s.* 11½*d.*; Southdown ewes and wethers, 1*s.* 7½*d.* to 1*s.* 8*d.*; Leicester, 1*s.* 9*d.* to 1*s.* 10*d.* The second series of colonial wool sales in London opened April 28 with a large number of English and foreign buyers. The catalogue embraced 7,000 bales—2,500 Port Philip, 1,200 Sydney, 1,400 Adelaide, 1,600 Cape, 300 New Zealand. The competition was spirited, and Australian washed wools maintained their position.

BUTTER.—The later quotations were, for Dorset, 136*s.* to 140*s.* per cwt.; Friesland, 130*s.* to 134*s.*; Jersey, 112*s.* to 130*s.*

CHEESE.—Cheshire, 70*s.* to 84*s.* per cwt.; Double Gloucester, 66*s.* to 80*s.*; Cheddar, 76*s.* to 94*s.*; American, 56*s.* to 80*s.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

JULY, 1873.

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1873.

MONTHLY REPORT.

CONDITION OF THE CROPS IN JULY.

During the month of June, conditions of vegetable growth were remarkably diversified in different parts of the country. In the New England and Middle States and as far south as the Chesapeake Bay, the general character of the season was one of drought; in many counties disastrous to vegetation. The opposite class of hygrometrical conditions prevailed in the South Atlantic and Gulf States, where the rain-fall was enormous in some localities and excessive in its general average. Cases are reported in which nearly every day of June was rainy. The ground became thoroughly saturated, and the grass gained such headway that many fields of corn and cotton were abandoned. This abundance of moisture, however, was unfavorable to the development of insect life, and consequently the depredations upon the cotton-crop were much less than the previous reports had given ground to fear. In the inland Southern States—Arkansas, Tennessee, West Virginia, and Kentucky—the rain-fall was abundant, and in many places excessive, but not to so injurious an extent as in the States farther south. South of the Ohio River the rains were generally moderate, and in many places the weather was reported very fine. Westward an increase of atmospheric disturbances is noticeable; heavy storms of wind, rain, hail, with thunder and lightning, were frequently destructive of growing crops. West of the Mississippi accounts are somewhat variant, the majority, however, showing an abundant rain-fall, while in no case is the drought severe. Heavy hail-storms are reported in this quarter also. In California the general character of June was cool and dry, with exceptions, especially in the northern part of the State. In Oregon the rain was more general and heavy; in some cases enabling farmers to dispense with irrigation entirely. In Linn County the rain-fall was greater than for twenty years.

WHEAT.

Our statistical correspondence represents a larger number of counties than in any previous report. Returns have been received from 918 counties growing winter-wheat, and from 337 growing spring-wheat; the former have increased 167 and the latter 51 since the June report, showing a total increase of 218. These returns have been carefully analyzed, and a synopsis of their statements will be found in the tabulated exhibits accompanying this article. The following table shows the status of all the counties reporting in regard to both winter and spring wheat:

States.	Winter-wheat.			Spring-wheat.		
	Counties above average.	Counties average.	Counties below average.	Counties above average.	Counties average.	Counties below average.
Maine	.....	1	1	1	2	6
New Hampshire	1	2	3	.....	4	4
Vermont	1	1	2	1	2	6
Massachusetts	.....	3	.....	1	1	2
Rhode Island	.....	.....	.....	.....	.....	.....
Connecticut	.....	1	1	.....	.....	1
New York	1	7	31	1	3	24
New Jersey	4	6	3	.....	.....	1
Pennsylvania	17	13	16	.....	3	11
Delaware	1	1	1	.....	.....	.....
Maryland	4	4	7	.....	1	.....
Virginia	12	21	38	.....	.....	.....
North Carolina	4	15	32	.....	5	8
South Carolina	.....	2	10	.....	.....	.....
Georgia	8	13	25	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....
Alabama	3	7	13	.....	.....	.....
Mississippi	1	5	1	.....	.....	.....
Louisiana	.....	.....	.....	.....	.....	.....
Texas	3	5	10	.....	.....	.....
Arkansas	9	4	5	.....	.....	.....
Tennessee	5	8	40	.....	3	11
West Virginia	7	7	15	.....	.....	.....
Kentucky	6	12	23	.....	.....	.....
Ohio	22	17	18	.....	3	12
Michigan	10	4	22	5	8	7
Indiana	8	14	30	.....	2	5
Illinois	6	11	34	1	4	2
Wisconsin	5	2	17	6	8	9
Minnesota	12	10	12	2	13	1
Iowa	2	5	9	25	16	6
Missouri	27	16	22	7	9	6
Kansas	21	8	8	16	11	7
Nebraska	1	4	6	10	4	3
California	5	3	12	1	2	10
Oregon	10	2	1	10	4	.....
Total	216	234	468	87	108	142

Of counties reporting winter-wheat, those above average have increased 14, or nearly 7 per cent.; counties average 66, or nearly 40 per cent.; counties below average 87, or 23 per cent. Winter-wheat improved during the month of June, in the general average, of the following States, viz: Delaware, Maryland, Virginia, Mississippi, Texas, Arkansas, Kentucky, Ohio, Indiana, Minnesota, Iowa, California, and Oregon. These States produced considerably more than half the crop of 1872. The condition of the crop during June remained stationary in New Jersey, Georgia, Illinois, and Missouri. Rhode Island, Florida, and Louisiana made no returns. A decline is shown in the remainder of the States, which produced about one-third of the crop of 1872. From a careful estimate of all the conditions of growth that have come within the purview of this investigation it would appear that the prospective yield of winter-wheat is substantially enhanced since our last report.

A large proportion of the winter-wheat, in several of the States, was reported in June as winter-killed. As the season advanced, however, it was discovered that in many cases the crop was only thinned out, and that its increased size and weight of heads and plumpness and beauty of berry promised a very considerable compensation for the losses of winter. An improvement in quality was also quite generally noted in several of the largest wheat-growing districts. In a large number of counties, however, wet weather during harvest not only de-

layed the gathering of the crop, but also threatened to injure it in the shock.

It was observed that early-sown fields of winter-wheat were far more promising than those later sown. The advantage of early-ripening varieties was also indicated by the fact that these escaped the ravages of insect enemies, which entirely swept some of the later crops. Of these early-ripening varieties the Fultz and Tappahannock from the Department, especially the Fultz, receive very frequent and honorable mention.

Of counties growing spring-wheat the number above average declined during June from 103 to 87, and counties average from 115 to 108, while the counties below average have increased from 68 to 142. The general condition of spring-wheat was enhanced in Ohio, Wisconsin, Nebraska, California, and Oregon. It declined in all the New England and Middle States, and in all the Northwestern States except those just mentioned. There is but casual mention of spring-wheat in the South. In New England the dry weather interfered with the growth of the crop, while in the Northwest, in many localities, a variety of insect enemies—the Hessian fly, the grasshopper, the chinch-bug, &c.—very seriously injured the crops. The deterioration of spring-wheat appears to have been greater in proportion than the improvement of winter-wheat, yet the larger amount of the latter grown in the country will probably restore the equilibrium. Upon a careful consideration of all points in the problem, the prospective wheat-yield of 1873, judging from its condition on the 1st of July, appears about the same as at the 1st of June, or about 220,000,000 bushels.

MAINE.—*Oxford:* Wheat a good set, but drying up.

VERMONT.—*Grand Isle:* Winter-grain wintered well. *Addison:* Early-sowed grain came forward rapidly with early showers, but suffers from late drought.

MASSACHUSETTS.—*Norfolk:* Wheat having had an early start, is not so much affected by the drought.

NEW YORK.—*Schoharie:* Winter-wheat looks well. *Wyoming:* Below average; winter-killed. *Chautauqua:* Winter-wheat thin, but well filled. *Livingston:* Mostly poor.

NEW JERSEY.—*Warren:* Fine; straw bright and clean; grain full and plump. *Morris:* Winter-wheat better than for many years. *Burlington:* Good quality. *Camden:* Early-sown wheat good; late-sown thin, but not rusty; drilled always best.

PENNSYLVANIA.—*Northampton:* Well ripened by cool weather while in bloom, causing it to fill well. *Montgomery:* Drought favorable to wheat; straw well grown; kernels well developed; promises an abundant harvest. *Lancaster:* Southern part of the county promises the largest crop ever grown. *Westmoreland:* Ripening very unevenly, but the berry is well filled; Fultz wheat badly winter-killed. *York:* Fields thick-set; of full growth and plenteous promise. *Armstrong:* Harvest two weeks late. *Clearfield:* Fair promise. *Chester:* Later varieties a little rusted; some injured by fly; otherwise it looks well. *Erie:* Unusually good. *Fayette:* Has wonderfully improved; the farmers who expected to get only their seed will have half a crop. *Washington:* Tappahannock first ripened. *Lebanon:* A tenth above average. *Snyder:* Best crop for many years. *Greene:* Crop short, but grain good. *Tioga:* Spring-wheat injured by drought. *Indiana:* Grain well filled.

MARYLAND.—*Montgomery:* Some fields very good; others below average; a white worm injuring the roots and destroying the crop in some cases. *Washington:* Improved lately in some places; in others injured by the fly. *Howard:* Good straw; average crop promised. *Talbot:* Fine harvest weather. *Saint Mary's:* Better than was expected; thin but well ripened. *Baltimore:* Somewhat injured by the fly, but the crop generally good; October seeding less injured than the earlier. *Kent:* Crop promising; season very favorable. *Caroline:* Straw short but heads good; much winter-killed. *Queen Anne:* Harvested in fine condition; later ripening grain particularly fine and plump.

VIRGINIA.—*Spottsylvania:* Crop very promising; heads full of fine large grains. *Pulaski:* Ten days late and but a third of an average. What escaped winter looks well; no indications of rust. *Bedford:* Crop shortened at least half by winter-killing; rust and smut also injuring some fields; others prostrated by a heavy storm. *Warwick:* Harvesting very indifferently; excess of rain has made it run to straw. *Rappahannock:* Rain threatens to injure the ripening wheat. *Fluvanna:* Remarkably good where not winter-killed; heads well filled. Tappahannock and Fultz have both done well; Tou-

zelle too late for the climate. *Page:* Harvesting well; grain good but yield 25 per cent. below average. Lancaster and amber varieties best for this climate. Rain now falling may injure the crop. None of the smooth wheats have matured well. *Stafford:* Better than last year. *Wythe:* Not over half a crop; few use the drill; drilled wheat looks much the best, especially when early sown. *New Kent:* Fine in quality. *Orange:* Damaged by winter-killing and fly, but greatly improved by late favorable weather; quality good; Fultz the best. *Nelson:* Badly winter-killed and unpromising in April, but harvested unexpectedly well; heads and grains unusually large. *King George:* Wheat greatly improved; fine harvest weather. *Powhatan:* Rains in May and fine June weather acted like magic, bringing the prospect to an average. *Clarke:* Since last report the Hessian fly has been very destructive on the crop; many fields destroyed and given to live stock for pasture. *Chesterfield:* Harvested in fine condition; excellent quality and large yield. *Washington:* One-half winter-killed. *Bath:* Very light. *Floyd:* What escaped winter-killing is fine, with large heads and superior grain. *Greenville:* Filled well; a tolerable crop. *London:* Injured by fly; where no fertilizers were used the crop is a total failure. *Middlesex:* Light straw; good grain; average yield. *Craig:* Thin, but filling well and of good quality. *Culpeper:* Fultz excels all other wheats. *James City:* Fultz promises 20 for 1; very popular. *Cumberland:* Fultz a great success. *Fauquier:* Injured by drought in some places. *Gloucester:* Crop heavy and remunerative on good lands well fertilized and tilled; German red generally preferred to the smooth heads. *Madison:* Generally very sorry; some fields rusted; a few good crops where not winter-killed. *Mecklenburgh:* Quality never better; Touzelle and Tappahannock yielded well. *Henrico:* Came out wonderfully. *Smyth:* Better than was expected. *Montgomery:* Ten days late; bottom crops rusted. *Henry:* Short but good. *Halifax:* Injured by chinch-bug. *Highland:* Badly winter-killed. *Essex:* Quality excellent. *Prince George:* Damaged 20 per cent. by rust.

North Carolina.—*Caldwell:* Largely winter-killed. *Burke:* Generally good. *Greene:* More or less injured. *Stanley:* Early red good; later varieties more or less injured. *Lincoln:* Marked improvement in wheat; farmers more hopeful of a fair yield. *Forsyth:* Better than was expected. *Catawba:* Broad-cast wheat froze out; drilled brings full crop. *Clay:* Almost a failure; Fultz very good. *Gaston:* Wheat shortened. *Davie:* Three-fourths of a crop; grain fine, heads large. *Guilford:* Winter-wheat in some places a half crop. *Davidson:* In many places winter-killed. *Alamance:* Very late harvest; 70 per cent. of a fair crop. *Gordon:* Not over 2½ bushels per acre. *Floyd;* Injured in the shock by wet. *Polk:* Injured by wet. *Jackson:* Touzelle not suited to the climate; Fultz excellent; stands winter well. *Stokes:* Touzelle did well; Tappahannock better.

South Carolina.—*Williamsburgh:* Yield reduced by heavy rains during the bloom. *Union:* Raise one-third of our supply. *Greenville:* Late sown a failure.

Georgia.—*Gwinnett:* Poor. *Gilmer:* Damaged in shock by wet. *Marion:* Touzelle a failure; Tappahannock good. *Polk:* Injured by wet. *Jackson:* Touzelle not suited to the climate. *Cobb:* Injured by wet. *Whitfield:* Early sown wheat good; late sowing mostly a failure. *Upson:* Wheat promising. *Schley:* Thrashed out finely. *Madison:* Very sorry crop—three bushels per acre. *Muscogee:* Below expectation.

Alabama.—*Jackson:* Wheat shortened by heavy rains. *Barbour:* Heavy rains have injured wheat. *Blount:* Much damaged in the shock. *Clarke:* Tappahannock ruined by rust. *Crenshaw:* White wheat from the Department grows finely. *Randolph:* Crop injured. *Saint Clair:* Damaged by rain in the shock. *Calhoun:* Fultz better than most varieties. *Marshall:* Fultz wheat from the Department a great success. *Lee:* Touzelle wheat not suited to climate; Tappahannock good, but ten days later than the native purple straw.

Mississippi.—*Lee:* Wheat did well though somewhat shrunk; white wheat has a strong straw, enabling it to resist the heavy winds and rains. *Winston:* White wheat winter-killed.

Texas.—*Bell:* Much grain injured by rain; thrashed between showers. *Gonzales:* Tappahannock and Touzelle badly rusted; Algerian and Turkish flint better for this latitude. *Medina:* Nearly destroyed by grasshoppers. *Ellis:* But little saved; that cut with cradles is damaged. *Bandera:* Destroyed by grasshoppers. *Hunt:* Much loss in harvesting from impracticability of using machinery. *Burnet:* Injured by grasshoppers. *Victoria:* All the wheat eaten up by rust. *Lampasas:* Will be injured in the shock. *Coryell:* Contrary to expectation a half crop will be gathered. *Kaufman:* Injured by wet in the shock. *Lavaca:* Rust has destroyed small grain cultures. *Blanco:* Both winter and spring wheat acreage increased 50 per cent. *Dallas:* Bad harvest weather; sprouted in shock, yet the average yield is estimated at 20 bushels per acre. *Collin:* Rainy harvest has caused much grain to be injured in the shock. *Kendall:* Entirely destroyed. *Tarrant:* Greatly injured by rain.

Arkansas.—*Fulton:* Yield light; berry good. *Arkansas:* Little raised; experimental crops good, though thin. *Independence:* Never better. *Newton:* Injured by protracted rains; affected with the spot; Tappahannock and Fultz from the Department ten days earlier than native varieties.

TENNESSEE.—*Hamilton:* Harvest over; half a crop; badly frozen out, and in many places spotted. *Smith:* Injured by wet. *Meigs:* Cut short by winter-killing, rust, and spot. *Montgomery:* Rain threatens to injure the grain in shock; expected to thrash out half a crop; Fultz wheat did very finely; yields well and ripens early; if it redeems its promise it will supersede all other wheats. *Hancock:* Wheat that escaped winter-killing looked well till just before harvest, when it was greatly injured by spot; same fields not worth cutting. *Giles:* Wheat sprouting in the shock. *Loudon:* Not over a half crop. *Carter:* Does not stand so well as last year, but better filled; quality fine. Fultz promises a great yield. *Wilson:* Damaged by hard winter and scab; but little over a half crop. *Putnam:* Badly spotted. *Monroe:* Short 15 to 20 per cent. *Henry:* Some wheat sprouted in the shock. *Humphreys:* Mediterranean, Amber beard, Golden chaff, Tappahannock, and Little May have done well. *Bedford:* Injured by smut and scab. *Roane:* Partly winter-killed; much of it lodged. *Lincoln:* Sprouting in the shock. *Knox:* Injured by severe winter and wet spring. *Cannon:* Harvested poorly, being injured by scab; sprouting in the shock. *Bradley:* Badly winter-killed. *Sevier:* Thin, but good; three-fourths of a crop. *Grainger:* Half a crop, five bushels per acre. *Robertson:* Injured by rain.

WEST VIRGINIA.—*Monongalia:* Largely winter-killed, but grain good and heads well filled. *Raleigh:* Tolerable. *Pendleton:* Greatly improved; good crop. *Braxton:* Winter-wheat thinned by winter-killing, but of good quality; Fultz did not freeze out; its heads are well filled and grain plump. Tappahannock also good. *Barbour:* Well filled, but thin on the ground. *Pleasants:* On some soils the crop is good; on others it suffered from frost and rain. *Mercer:* Frozen out badly, hence a bad stand; midge destructive in some fields. *Jackson:* Harvested well. *Harrison:* Thin on the ground, but well filled; crop short. *Hardy:* In some localities badly winter-killed; in others more or less injured by the fly and chinch-bug; smooth varieties on low grounds considerably shortened by rust. *Cabell:* Some complaints of rust, smut, and midge. *Pocahontas:* Fair prospect. *Monroe:* Not over a third of a crop.

KENTUCKY.—*Owsley:* Mostly winter-killed, and what escaped was badly spotted; Touzelle struck with black rust while in bloom; Fultz from the Department the best of all. *Boyle:* Touzelle badly rusted. *Warren:* Crop well saved; grain good and crop satisfactory. *Johnson:* Injured by rain somewhat. *Clinton:* Better than was expected; grain well developed; will probably be injured in the shock. *Scott:* Harvest delayed by wet weather. *Russell:* Injured by fly and chinch-bug, yet a full average; Tappahannock a fair crop; Fultz 75 to 100 per cent. better; it is the finest wheat yet seen here. *McLean:* Thin, but grain good. Tappahannock and Fultz very successful, but the Touzelle too late for the climate; it was badly winter-killed. *Mercer:* Damaged by frequent rains; Fultz much the most promising. *Logan:* Injured by smut, scab, and rust; cut wet and shocked wet, and will probably sprout in the shock. *Henry:* What escaped winter-killing has been greatly injured by the midge. *Taylor:* Fultz has done splendidly; Touzelle a failure. The Fultz stands winter better than any other; brings fine large heads, 60 or 70 grains per head; grain large and plump; wheat will be damaged in the shock. *Lincoln:* Crop injured by rain. *Hardin:* Will average about 6 bushels per acre; Fultz will make 15 bushels. *Marion:* Generally affected with scab, but harvested in good condition; better crop than was expected. *Anderson:* Looks well; some complaints of light weight and insect injuries. *Shelby:* Thin on the ground, but over average; midge just reported. *Fayette:* Generally thin on the ground; late crops badly rusted; midge hard on late-sown wheat. *Butler* Badly frozen out. *Laurel:* What escaped winter-killing looks well. *Adair:* Somewhat injured by rust.

OHIO.—*Hamilton:* Fultz wheat gives satisfaction. *Athens:* Bottom crops swept by floods. *Hancock:* Full average crop, but badly thrown down by late storms. *Holmes:* Well filled and good, but prostrated by late storms. *Washington:* Generally light on old and thin lands. *Warren:* Harvest in progress; it is feared that the great amount of rain will damage the grain in the shock. *Portage:* Looks well. *Ottawa:* Largely winter-killed. *Morrow:* Some fields good; others injured by wet; many rusted. *Delaware:* Within a few days rust has injured late winter and spring wheat, yet the crop is quite promising. Fultz wheat from the Department behaving splendidly; large yield and good flour. *Crawford:* Nearly average; but little rust. *Vinton:* Fultz our best wheat. *Pickaway:* Tappahannock and Fultz wheats are very fine. *Lorain:* Very promising. *Erie:* Harvest late. *Ashland:* Crop has come forward rapidly; straw copious and clean; berry full and plump. *Adams:* Unusually early harvest; crop will average from 7 to 9 bushels per acre. Fultz very fine; ripened June 24. *Medina:* Spring-wheat sown late and hurriedly; season not propitious, but a fine growing shower has lately fallen. *Jackson:* Good crop. *Greene:* Fine; crop safe. *Ross:* Crop a grand one. *Logan:* Crop heavy on bottom-lands, but through fall drought and winter-killing it is light on uplands, except where early sown. *Noble:* Best crop for many years.

MICHIGAN.—*Kalamazoo:* Greatly shortened by drought; not over a half-crop. *Newaygo:* Fine June weather greatly improved the crop. *Montcalm:* Reduced a third

by winter-killing. *Lapeer:* Fair crop, except on hill-sides and ridges denuded of snow in winter by the winds. *Kent:* Badly winter-killed. *Benzie:* Rust has appeared. *Washtenaw:* Not a usual crop. *Tuscola:* Below average, but better than last year. *Shiawassee:* Largely winter-killed; heading short through drought. *Mecosta:* Winter-wheat remarkably good; some fields average 40 to 50 bushels per acre; Fultz and Tappahannock succeeding better than the old standard varieties. *Hillsdale:* Largely winter-killed. *Clinton:* Suffered from the late drought. *Cass:* Lightest average in twenty years. *Van Buren:* Light crop. *Ionia:* Badly injured in winter. *Calhoun:* At least 10 per cent. winter-killed; injured by spring cold and drought. *Branch:* Not over two-thirds average.

INDIANA.—*Putnam:* Injured by late storms; much remains uncut, having been injured by chinch-bugs and black rust. *Brown:* Long heads well filled; grain large and plump; rather thin in the ground. *Miami:* Fultz splendid; promises to double the yield of the Egyptian in the same field. *Perry:* Badly blown down; late. *Morgan:* Heads large and well filled; grain fine; thin on the ground in many places. *Montgomery:* Thin on the ground in some places; where thick it has considerably fallen down on account of late winds and rains. *Wells:* Fultz ripened early; Arnold's Hybrid No. 9 promises well; wheat universally well headed, and will yield well in proportion to the straw. *Knox:* Considerably black-rusted by wet; damaged at least 15 per cent. *Jasper:* Most winter-wheat winter-killed; some fields protected by timber-belts escaped. French spring-wheat grew well till hot weather, when it died. *Howard:* Thin on the ground, but well headed and well filled. *Gibson:* Average; grain good. *Fulton:* Badly winter-killed; rain renders harvest precarious. *Franklin:* Badly injured by the fly. *Switzerland:* Best crop, both in quality and quantity, for years. *Stark:* Badly winter-killed, but what survived is well filled. *Noble:* Injured by winter; drought prevented it from filling well. *Newton:* What escaped winter-killing is doing well; spring-wheat, little sown, but promising. *La Porte:* Fly in the spring-wheat, which will not be over half a crop. *Harrison:* Better than was anticipated; thin, but well headed and well filled; weather favorable, but harvest late. *Hamilton:* Tolerable quality, but badly lodged; unfavorable harvest weather; much wheat will be lost. *Cass:* Light crops, but well headed; better than was anticipated. *Bartholomew:* Winter-wheat very good; harvest delayed by wet weather. *Kosciusko:* Badly winter-killed on prairies; extra near timber. *Dubois:* Thin, but well eared, and of good grain. *Lake:* Winter-wheat almost entirely winter-killed. *Owen:* Fine heads and healthy straw. *Orange:* Thin, but better headed and filled than last year; fields often choked with rag-weeds; Allen's hybrid excels; fully medium with good white wheat. *Decatur:* Badly winter-killed and injured by the fly. *Huntington:* Cut-worms in the crop in some places. *Scott:* Thin on the ground, but well headed. *Vanderburgh:* Fine breezes saved wheat from rust in the warm, wet weather.

ILLINOIS.—*Douglas:* Too wet for harvest. *Perry:* Wet time for harvest; wheat will be injured in the shock. *Ogle:* Spring-wheat looks well, but is in danger of spoiling from wet weather; winter grain injured by freezing. *Massac:* Injured by scab; thinned by freezing. *Lee:* French spring-wheat shows no indications of heading. *Fayette:* Looks well, but harvest weather is unfavorable. *Edgar:* Acreage of winter-wheat reduced 15 per cent. *Cass:* Rain delays harvest; spring-wheat injured by chinch-bugs. *White:* Some fields of winter-wheat plowed up for corn; wheat injured by chinch-bugs; grain generally good. *Richland:* Harvest delayed by heavy rains. *Cumberland:* Harvest late. *Stephenson:* Small grain getting a remarkably heavy growth. *Putnam:* Spring-wheat looks well. *Macon:* Harvest ten days late; Fultz and Tappahannock both froze out. *Lawrence:* Better headed than for many years; will be injured in the shock by wet, the storms having knocked the shocks down. *Lake:* Small grains doing finely. *Hancock:* Badly winter-killed. *Fulton:* Badly winter-killed, but coming out better than was expected; spring-wheat looks fine. *De Witt:* Spring-wheat very promising. *De Kalb:* Spring-wheat looks fine; winter-wheat not so good. *Clinton:* Very wet harvest; much grain will be damaged in the shock. *Carroll:* Provence spring-wheat has not headed; it is probably a winter-wheat. *Whiteside:* Small grain doing extremely well. *Pike:* Winter-wheat spotted by the winds of winter blowing snow from ridges; well headed and not so weedy as last year. *Jersey:* Good, well filled; harvest-weather fair. *Iroquois:* Acreage of spring-wheat restricted by unfavorable spring. *Clark:* Crop better than was expected. *Sangamon:* Injured by hail-storm June 27; winter-wheat thin, but of good quality; spring-wheat generally very fine.

WISCONSIN.—*La Crosse:* Winter-wheat three-fourths winter-killed. *Outagamie:* Badly tangled by storms. *Dunn:* Early-sown wheat good. *Dane:* Spring-wheat threatened by chinch-bugs. *Calumet:* Some pieces, not sheltered by timber, winter-killed; spring-wheat never looked better. *Jefferson:* Winter-wheat completely winter-killed. *Green Lake:* Winter-wheat badly winter-killed. *Richland:* Heavy pieces of winter-wheat badly blown down; will thus be injured in filling. *Fond du Lac:* Excessive rain has caused an overgrowth of straw; many acres blown down and liable to rust

and rot; if the weather continues dry and cool we shall have the largest crop since 1860. *Brown:* Largely winter-killed.

MINNESOTA.—*Renville:* Looks well. *Goodhue:* Spring-wheat promises well. *Houston:* Partially winter-killed; spring-wheat never better; just headed out. *Martin:* Badly injured by grasshoppers. *Jackson:* Grasshoppers have ruined the crops, so that grain enough will not be raised in the county for home necessities. *Faribault:* Badly injured by wet, especially on low grounds. *Douglas:* Prospects never so good before. *Watonwan:* Injured 20 per cent. by May and June rains. *Meeker:* Injured by wet on low heavy soils, but fine on light soils. *McLeod:* Wheat-culture giving way to stock-raising, to some extent. *Fillmore:* Very heavy on the ground and just heading out. *Dakota:* Grain of all kinds never looked better. *Cottonwood:* Spring-wheat prospect very fine up to June 15, since which time grasshoppers in large numbers have appeared, injuring all the crops; on some farms the wheat is entirely destroyed and the whole county reduced to half an average. *Carver:* Some fields winter-killed and plowed up; those that escaped look fine. *Wright:* Grain on prairie farms reduced one-half by heavy rains of May and June followed by hot weather. *Blue Earth:* Badly damaged by rain; some fields plowed up and sown to flax. All grain, except on high lands, looks badly.

IOWA.—*Dallas:* Acreage of wheat unusually large; many fields lately rusted. *Page:* Acreage of spring-wheat fully three times as great as last year. *Plymouth:* Looks well on fall plowing; on spring plowing there is a yellow crust, not promising a good yield. *Muscatine:* Somewhat winter-killed. *Madison:* A few fields badly scabbed. *Lee:* More spring-wheat sown than for many years; good prospects. *Des Moines:* Spring-wheat badly lodged. *Cherokee:* Somewhat injured by grasshoppers. *Shelby:* Spring-wheat straw very heavy; much lying down. *Decatur:* But half the wheat necessary for home consumption grown in the county for the past twenty years. *Wayne:* Better than for five years. *Harrison:* Spring-wheat promising. *Guthrie:* Grew so rank on strong lands that much of it fell down; fine prospects now. *Calhoun:* Looks well. *Crawford:* Looks better than ever before.

MISSOURI.—*Dallas:* Chinch-bugs doing mischief. *Wright:* Suffered from fly and chinch-bug as well as from spring cold. *Benton:* Chinch-bug destroyed 15 per cent.; early-sown wheat much the best. *Barry:* Considerable scab; chinch-bugs did some damage; some ripened unevenly; Tappahannock and Fultz badly frozen, but ripened and filled well; Touzelle almost all winter-killed and fails to fill. *Vernon:* Early-sown a good crop; late-sown taken by chinch-bugs while in bloom or milk; the latter will not average over 3 bushels per acre. *Sullivan:* Nearly average; grain will be extra if fair weather continues. *Phelps:* Injured by chinch-bugs. *Ozark:* Quality, average; quantity, 5 per cent. below. Fultz wheat superior to Flint, both in quality and quantity. *McDonald:* Wheat sent by the Department gives general satisfaction. *Jefferson:* Much over average. *Howard:* Fine; Tappahannock rather more injured by frost than other varieties. *Clay:* Winter-wheat came out splendidly. *Cedar:* Drilled wheat generally good; broadcast inferior; some crops injured by chinch-bug, which appeared a week before harvest, and hence some fields were cut prematurely. *Worth:* Prospects fine. *Saint François:* Seriously injured by chinch-bug. *Reynolds:* Thinned by fall drought, but heads look fine. *Pulaski:* Promises a large increase; chinch-bug has injured it in some places. *Nodaway:* Spring-wheat lodged by late storms of wind and rain. *Moniteau:* Prospect fine on timber-land; largely winter-killed on prairies. *Lincoln:* Grain fine and yield large; estimated at 30 to 35 bushels. *Lawrence:* Damaged by chinch-bugs; spring-wheat from the Department looks fine. *Holt:* Wheat average, but an average is poor. *De Kalb:* Wheat very fine. *Bollinger:* Injured by chinch-bugs. *Bates:* Would have been far above average but for chinches. *Adair:* Fultz and Tappahannock all froze out. *Saint Genevieve:* Early-sown winter-wheat extra in quantity and quality; chinch-bug badly injuring the late sown and late maturing crops. *Crawford:* Injured by chinch-bugs; came a little later than last year, catching only the later fields. *Cole:* Fair yield; heads large and well filled; berries large and even; on good farms the average will be from 15 to 20 bushels per acre. *Christian:* Thin. *Barton:* Promising up to June 25, when the chinch-bug appeared and did great injury; much wheat cut green to evade the bugs. *Jackson:* The winter-wheat undoubtedly the best and heaviest grown in the county for thirty years. *Caldwell:* Not thick, but heads large and well filled. *Chariton:* Heavy crop in prospect. *Cass:* Crop extra. *Henry:* Materially injured by chinch-bugs; some crops harvested very green to escape the bug. *Platte:* Injured by wet.

KANSAS.—*Smith:* Winter-wheat an entire failure; it spread over the ground instead of running up into stalks; it may live over another winter and make good wheat next year, as it did not sprout till spring. The wheat that got started in the fall was all winter killed. The Provence spring-wheat from the Department grew well till June 10, when it fell down and died. On examination it was found full of small insects near the roots. *Cowley:* Prospects good; some chinches in spring-wheat. The Provence spring-wheat not so early as our other varieties; Fultz fine and large headed. *Shawanee:* Better than last year. *Sedgwick:* Storms have prostrated small grain; no rust yet. *Riley:* Winter-wheat thin; weedy and winter-killed. *Howard:* Spring-wheat troubled with

chinch-bugs. *Jefferson:* Satisfying prospects. *Nelson:* Many fields ruined by chinch-bugs; some plowed under. *Washington:* Winter grain better than was anticipated; very excellent; no rust. Spring-wheat promises an increased yield. *Sumner:* Excellent. *Neosho:* Looked well till the chinch-bug came, a few days before harvest; some pieces entirely destroyed. *Labette:* Chinch-bugs have destroyed one-fifth of the crop; two-fifths injured from 25 to 75 per cent.; the remaining two-fifths, including all the early-sown, escaped. This is the third visitation of these bugs. Best way to evade them is to sow early and use early-maturing varieties. Then cut the wheat with headers, plow a furrow round the field and fire the straw, burning it clean. Raise no grain on contiguous ground for a season or two. *Linn:* Excellent; seldom better. *Dickinson:* Very promising. *Cherokee:* Injured by late rains and chinches. *Bourbon:* Many fields destroyed by chinches; Fultz wheat has escaped and is plump and fair. *Woodson:* Much injured on bottom-lands; spring-wheat injured by chinches and rose-bugs. *Morris:* Promises a fine yield of superior quality. *Davis:* Spring-wheat on bottom-lands badly damaged by wind and rain; winter-wheat on uplands generally good. *Coffey:* Mostly harvested in fine condition; quality good. *Leavenworth:* Good. *Douglas:* Never better; mostly secured. *Montgomery:* Somewhat injured by chinches, especially spring-wheat. *McPherson:* Fall-wheat greatly improved in two months.

Nebraska.—*Burt:* Promising on table-lands; poor on bottoms. *Jefferson:* Winter-wheat almost a failure; many farmers have sowed their last crop. Spring-wheat extra good, with an increased acreage. *Cass:* Heavy straw; scab or blight appearing. *Richardson:* Looked finely till injured by late rains. *Nemaha:* Winter-wheat badly winter-killed. *Boone:* Suffering from drought. *Merrick:* A full crop. *Hall:* Small grain much damaged on lowlands.

California.—*Klamath:* Injured by excessive rains. *Humboldt:* Extra. *San Bernardino:* Lacks rain. *Mendocino:* The only spring-wheat raised is from neglected sowings of isolated pieces which the farmers have postponed till spring; these sowings are, this year, very short. *Placer:* Crop harvests much better than was expected; full average. *Santa Clara:* Most of the late-sown grain a failure; quality good; crop will be about two-thirds average. *Stanislaus:* Wheat yield greatly overestimated; dry weather prevented the grain from filling well. *San Luis Obispo:* Injured by drought and grasshoppers. *Sacramento:* Shortened by drought. *Del Norte:* Spring grain greatly improved by heavy showers since June 15. *Butte:* Grain more or less shrunk. *Amador:* Want of rain. *Sonoma:* No fears of a short crop; grain excellent, full and plump. *Fresno:* Greatly benefited by cool weather in June; will average 15 bushels per acre. *Monterey:* Will be superior to last year's crop. *Contra Costa:* Cool weather prevented rust and smut.

Oregon.—*Polk:* Grain crops fine. *Columbia:* Exceedingly fine. *Multnomah:* Season favorable to grain.

Dakota.—*Bonhomme:* Promise of a splendid crop. *Hanson:* Looks well. *Yankton:* Would have been in advance of last year but for a severe hail-storm June 14, in the eastern part of the county.

Montana.—*Deer Lodge:* Grain crops two weeks late. *Lewis and Clarke:* Harvest late.

Colorado.—*Larimer:* Greatly damaged by grasshoppers.

New Mexico.—*Santa Fé:* Grain started by late rains.

Utah.—*Kane:* Promises a yield above average.

Arizona.—*Maricopa:* Acreage increased; promise below last year.

Washington.—*Thurston:* An abundant harvest in prospect. *King:* Weather unfavorable to grain crops.

CORN.

Area compared with last year.—The only States in which the acreage is reported the same as last year are West Virginia and Minnesota. Florida and Arkansas return an increase of 5 per cent.; Alabama, 2; Mississippi, Iowa, and Missouri, 1; Louisiana, 7; Texas, 8; Wisconsin, 3; Kansas, 15; Nebraska, 11; Maine, Michigan, and Oregon, a decrease of 2 per cent.; New Hampshire, New York, New Jersey, Delaware, and Indiana, 5; Vermont and Ohio, 6; Massachusetts, South Carolina, and California, 8; Rhode Island and Illinois, 12; Connecticut, Virginia, and Tennessee, 1; Pennsylvania and North Carolina, 4; Maryland, Georgia, and Kentucky, 3. In 1,124 county-returns the acreage in 449 is the same as last year; 307 indicate an increase; and 413 a decrease.

The low price of corn in the Northwestern States, the backward, wet,

frosty spring, and the extraordinary amount of rain in all except the New England and Middle States during the planting season, are among the causes which have checked an increase, and to some extent occasioned a decrease in acreage. It will be seen that in all the Gulf States there is an increase. This result, due mainly to a healthy tendency in the cotton States toward producing their own supplies, has, perhaps, been perceptibly increased by the amount of cotton-fields plowed up and planted in corn. The largest absolute falling off, by far, is in the great corn-growing State of Illinois, in which there is also a still larger falling off, 15 per cent., in condition.

Condition.—Owing to the peculiarities of the spring weather the planting of corn was almost universally late. Throughout the Northern, Middle, and Northwestern States the seed, to an unheard-of extent, failed to germinate. This is generally accounted for on the supposition that the seed-corn, not being sufficiently dried in the autumn, was injured by the extraordinary freezing of last winter. This failure, together with the extensively prevailing wet, cold weather during the season of its germination, and the consequent depredations of worms, has occasioned an unprecedented amount of replanting, often the second, and in not a few cases the third, and even the fourth time. In the New England and Middle States, also in Ohio, Michigan, and sections of adjacent States, and in California, an early drought checked its growth, while South and West protracted wet weather has greatly hindered cultivation, and multiplied weeds and grass. These causes combined left the crop, July 1, generally quite backward and in an unfavorable condition. But as the stand is nearly, if not quite, average, as the too dry weather at the North and the too wet at the South and West has already changed for the better, and as July and August are the months in which corn is made, (except in the cotton States,) there is yet a chance for great improvement and a much larger crop than the condition at the date of reporting seemed to indicate. At that date, only three States—Georgia, 103; Florida, 106; and Arkansas, 101—came up to average in condition. Maine and Connecticut were below, 13 per cent.; New Hampshire, North Carolina, and Kentucky, 8; Vermont and New York, 24; Massachusetts, 9; Rhode Island, New Jersey, Delaware, and California, 12; Pennsylvania, 20; Maryland and South Carolina, 16; Virginia, Mississippi, West Virginia, and Wisconsin, 4; Alabama and Kentucky, 7; Louisiana and Illinois, 15; Texas, Michigan, Indiana, Minnesota, and Nebraska, 10; Tennessee, 1; Ohio, 14; Iowa, 11; Missouri, 2; Oregon, 3. By counties, 271 return average condition, 220 above, and 680 below.

"Cut-worms" have been quite generally troublesome, and especially so in Maryland; grasshoppers, which destroyed much of the first planting in Texas, but left in season for a second planting, are injuring the crop in some sections of California, and chinch-bugs are threatening extensive injury to it in Missouri and Kansas.

The facts of acreage and condition may be learned more in detail from the following table and from the subjoined extracts from correspondents:

States.	Acreage.				Condition.		
	Number of counties reported.	Number of counties greater than last year.	Number of counties the same as last year.	Number of counties less than last year.	Above average.	Average.	Below average.
Maine	9	3	3	3	.....	2	7
New Hampshire	8	.....	5	3	.....	3	5
Vermont	10	.....	5	5	.....	.....	10
Massachusetts	8	.....	3	5	1	3	4
Rhode Island	3	.....	1	2	.....	1	2
Connecticut	6	1	3	2	.....	1	5
New York	42	4	26	12	.....	5	37
New Jersey	13	.....	10	3	.....	5	8
Pennsylvania	47	6	25	16	1	5	41
Delaware	3	.....	1	2	1	1	1
Maryland	15	2	8	5	.....	1	14
Virginia	73	16	41	16	20	20	33
North Carolina	58	7	29	22	9	14	35
South Carolina	16	2	6	8	2	3	13
Georgia	16	13	22	26	33	11	17
Florida	13	7	5	1	10	1	2
Alabama	36	14	10	12	7	12	18
Mississippi	30	9	11	10	8	9	12
Louisiana	21	7	12	2	5	6	12
Texas	57	35	12	10	13	11	32
Arkansas	30	16	13	1	13	5	12
Tennessee	56	13	24	19	16	15	25
West Virginia	29	11	9	9	8	9	12
Kentucky	43	10	18	15	11	10	22
Ohio	57	10	19	28	3	11	43
Michigan	36	11	13	12	6	6	24
Indiana	53	8	17	28	4	10	39
Illinois	66	3	15	48	5	10	50
Wisconsin	32	11	10	11	9	8	15
Minnesota	35	11	13	11	3	15	17
Iowa	50	14	14	22	4	13	33
Missouri	66	32	21	13	18	18	30
Kansas	39	18	6	15	3	14	22
Nebraska	17	6	6	5	3	3	11
California	19	3	8	8	1	6	12
Oregon	12	4	5	3	3	4	5
Total	1,124	307	449	413	220	271	680

MAINE.—*Androscoggin:* Looks fine though small. *Oxford:* Germinated poorly; much replanted.

NEW HAMPSHIRE.—*Carroll:* Small for the season, but the warm days of late make it look more healthy.

VERMONT.—*Windham:* Has suffered much from drought. Much corn has not come up. *Rutland:* Suffering from a severe drought; but very little rain has fallen since the snow went off.

MASSACHUSETTS.—*Norfolk:* The acreage of corn is about average, but the condition is affected by the dry weather. Large patches have failed to vegetate for the want of moisture. *Dukes:* Not yet seriously affected by the severe drought.

NEW YORK.—*Oneida:* Suffering from drought. *Niagara:* The cut-worm has made terrible work with corn. *Rensselaer:* The crop the shortest for the season that I have ever known, not excepting the cold season of 1816. *Saratoga:* Protracted drought seriously affecting all crops; corn planted early is looking quite well, but late-planted did not come up evenly. *Chenango:* It has been so dry that much of the corn planted did not come up. *Chautauqua:* Badly eaten by grub-worms. *Orange:* In consequence of the drought, commencing in the latter part of May and continuing through June, late corn did not start well. *Wyoming:* Did not come up well; the cut-worm has worked more than usual. Many fields have been plowed up and sown to western corn for fodder. *Kings:* Looks about the same as last year. *Livingston:* Came up badly, and then the cut-worm begun to work at it. *Jefferson:* Was not much affected by the drought, and looks well. *Onondaga:* A terrible drought has injured our crops; hundreds of acres of corn have been plowed up and sown to corn and buckwheat. *Sullivan:* A severe drought is shortening the crop. *Suffolk:* Suffering from drought. *Allegany:* That planted in May failed to come up.

NEW JERSEY.—*Burlington:* The drought has made corn more backward than usual,

but it looks well and is clean. *Morris:* The drought has injured crops; corn short and backward.

PENNSYLVANIA.—*Northampton:* Put in three weeks later than usual; prospect poor. *Montgomery:* Indications of a large crop. *Snyder:* The crop will be short in consequence of the trouble of getting good seed; much of the first planting did not come up. *Union:* Very backward on account of dry weather. *Lebanon:* Very backward. *Cambria:* Owing to the late cold spring the planting was delayed, and when planted much of the seed rotted, which necessitated replanting. This with a few weeks of dry weather has kept the crop back very much. However, it is now making wonderful progress under the influence of warm suns and genial showers. *Butler:* Three weeks behind. *York:* Looks fresh and promising; season dry. *Westmoreland:* The dry weather during the past month has greatly injured the corn. *Lancaster:* Looks very irregular on account of late or irregular planting, but is growing more than any other crop. *Clearfield:* Came up very poorly; the vitality of the seed supposed to have been injured by the extreme cold of last winter. Replanting once, and sometimes twice, was very common. *Bucks:* Came up uneven, but is doing well. *Armstrong:* Did not come up generally; second planting also failed for want of rain. The seed is blamed, but the same seed grew in some fields and not in others. *Washington:* Very backward. *Lycoming:* Very backward and in many places quite thin on the ground, owing to the cold spring and to the seed being injured by the cold last fall before the cob was free of sap. *Lehigh:* Planted late on account of the wet season, and so much of the seed did not sprout that many farmers were obliged to replant, which was continued up to July. *Huntington:* In bad condition owing to the seed not growing. *Fayette:* Very backward, owing to the late cold spring; much of the seed did not germinate and the cut-worm injured many sod-fields, rendering replanting necessary. The grub-worm is also doing some damage. *Erie:* A great failure of seed; one-half the ground had to be planted over again. *Centre:* Probably but about half a crop, owing to the use of poor seed. The seed seems not to have been sufficiently dried before cold weather. *Beaver:* Short on account of late planting, but growing very well. *Cameron:* The season cold, dry, and about one month late, which accounts for the decreased average of corn. It is in a healthy condition though small. *Lawrence:* As a general thing had to be replanted, on account of the seed not germinating, and is very short; will not be more than half a crop. *Indiana:* Will be light. The seed all proved to be in a bad condition and had to be replanted two or three times, and yet stands on the ground short.

DELAWARE.—*New Castle:* Not rain sufficient to wet the ground since May 20; crops suffering.

MARYLAND.—*Washington:* Has had a bad enemy in the cut-worms, and the dry weather has kept it back, but late rains are improving it. *Baltimore:* Before planting finished, cut-worms were more troublesome than ever known before. The stand is much below average. *Kent:* The grub-worm has injured the corn. *Howard:* Very little corn-ground plowed last fall owing to the early winter. Hence less acreage and to a large extent the cut-worm, which has been very destructive, necessitating in some cases complete and repeated replanting. *Saint Mary's:* On some land badly killed out by worms after being planted the second time. *Charles:* The average condition is lower in consequence of the cut-worms; many fields having been planted four times. *Caroline:* Has made a good growth considering that we have had no rain for a month. *Queen Anne:* Bad stands; much of that now standing having been replanted late; not more than half as high as last year.

VIRGINIA.—*Spottsylvania:* Not so tall as usual, owing to the cool spring, but very healthy. *Pulaski:* Small, being planted late, but looks thrifty. *Bedford:* The planting retarded, and the corn much injured after planting by heavy and continued rains. *Stafford:* Condition better than last year. *King and Queen:* The heavy rains and cold weather during the month of May caused much of the corn to rot, making it necessary to replant it. This makes it late and small. *Fluvanna:* Promising, though small. *Wythe:* Looks well for the time it was planted—three weeks later than usual. *Warren:* Much trouble by the worm. *Powhatan:* Good. *King George:* Very promising. *Caroline:* Season propitious for corn. *Prince Edward:* Planted later than usual; otherwise, a full average. *Orange:* Never more promising at this season. *Washington:* Healthy, though late. *Chesterfield:* That planted early badly drowned; but now all planted and worked, looking very promising. *Clark:* The cut-worm has injured the corn more than ever known before; consequently, the crop is very backward and small. *Middlesex:* Suffering from extremely dry weather. *Greenville:* Never appeared better at this season. *Bath:* Very late, and very much troubled with the grub-worm. *Fauquier:* Promises a full crop. *Madison:* Looking well. *Mecklenburgh:* Looking badly, on account of the cold, wet spring. *James City:* Planted late, and therefore quite low for the season; but the drought having enabled farmers to work in it almost every day, it is in beautiful order. *Campbell:* Late; otherwise, equal to that of last year. *Prince George:* Late; though small it looks healthy. *Henrico:* Prospect fine for a large yield. *Highland:* Much retarded by late planting, caused by much rain; doing

well now. *Essex:* Bad stand, in consequence of unprecedented ravages of the cut-worm.

NORTH CAROLINA.—*New Hanover:* Entirely killed out by heavy frost in April; second planting much retarded by wet weather and scarcity of labor. *Chowan:* Neglected, to save the (too much) cotton, and the result will be short crops of both corn and cotton. *Sampson:* Small, but green and good-looking on uplands; very small on lowlands. *Mecklenburgh:* Small and badly worked, in consequence of heavy rains in May. *Cumberland:* At least twenty days behind average season. *Camden:* While the acreage of cotton has been increased to a large extent, corn has not been neglected. Our farmers will raise their own supplies, and not have a crop to sell and nothing to eat. *Anson:* On uplands, doing remarkably well, and that on lowlands recovering rapidly since the excessively wet weather has passed away. *Alamance:* Did not get a good stand at first, owing to frost and cut-worm; now doing well. *Beaufort:* A little below an average. *Cherokee:* Promising very well. *Moore:* Late; with favorable season from this time, will be an average crop. *Person:* Suffering from drought. *Polk:* Generally in the weeds and grass. *Caldwell:* Seriously injured by the wet weather and consequent want of work. Many farms are almost entirely ruined by the most destructive freshet in the Yadkin River that has occurred since the county was first settled. *Madison:* A great deal of wet weather, and the crop not being cultivated as well as it should be. *Ashe:* A great deal of rain, and our corn prospect bad.

SOUTH CAROLINA.—*Clarendon:* Prospect not so good as last year. *Chester:* First planting injured by frost, April 24; the second planting on bottom-lands nearly destroyed by freshet, June 14. *York:* Has suffered from cold and wet weather, as the principal crop is cultivated on lowlands where most affected by these causes. *Newberry:* The lowlands have been planted and replanted and are deficient in stands. The continued wet weather has in many instances destroyed the crop. *Lexington:* Early corn all cut down by the severe frost on the 26th of April. A month later, in a portion of the county, torn to shreds by a terrible hail-storm. *Greenville:* Looks well, but has not been properly worked; in many cases the weeds and grass are as high as the corn. *Marlborough:* Unusually fine where it has been worked. *Richland:* Prospect very good; many farmers, however, on the rich river-lands have not been able to plant a full crop on account of the excessive rains. *Chesterfield:* Prospect worse than I have ever known it. *Williamsburgh:* Where not neglected to save the cotton, is about average. *Orangeburgh:* Has failed.

GEORGIA.—*Upson:* Fine. *Clinch:* The heavy rain during June has cut off the corn-crop fully one-third. *Hart:* Crop generally good. *Liberty:* Crop injured by rain and grass. *Douglas:* Doing well on upland. *Muscogee:* Below an average; too much rain during June. *Effingham:* Very poor. *Wilkes:* Precarious; the past month very rainy and corn very full of sap. Hot dry weather would now ruin the crop. *Sumter:* Prospect better than for ten years. *Dooly:* Not looking well, owing to too much rain. *Baldwin:* Much of the month of June the soil was too wet for plowing, and the grass has obtained the mastery in many of the plantations. *McIntosh:* Much injured first by the long drought, and since by the heavy rains. *Gwinnett:* Excessive rains during May and June have prevented the crops from being well worked; corn on uplands promises well; on creek and river lands it is poor. *Clayton:* Has suffered on bottom-lands in consequence of the rains. *Putnam:* Looks well. *Spaulding:* Daily rains since the 1st of June; corn on bottom-land badly injured; upland, fine. *Twiggs:* Looking finely. *Laurens:* Never better. *Whitfield:* Never more promising. *Franklin:* Never looked better. *Carroll:* On bottom-land almost a failure—drowned out. Yellow field-corn doing well, and will make a good crop; proved to be very early. *Cobb:* Doing well on upland. *Fayette:* It rained six days out of seven in June, and consequently corn on bottom-land is destroyed. *Wilkinson:* Fine as could be asked for.

FLORIDA.—*Madison:* Acreage 25 per cent. greater than last year; farmers satisfied with the crop. The Pennsylvania yellow corn is very highly esteemed as an early corn. *Orange:* Much above the average in appearance. *Jackson:* Crop was never better. *Hamilton:* Crop continues good; more corn will be made this year than usual. *Clay:* The wet weather is injuring the crop very much. *Leon:* Best crop I have ever seen in the county. *Columbia:* Best crop for several years. *Levy:* More corn made in this part of the State than for three years past altogether.

ALABAMA.—*Jackson:* Growing rapidly, but very weedy. *Blount:* Very promising. *Hale:* Rain has been falling in torrents for the last six weeks, so that the crop is very grassy. *Macon:* The heavy rains have prevented it from being worked, and much of the crop will have to be turned out. *Green:* On low places very much damaged by too much rain. Labor not sufficient for the crops in their present condition. *Crenshaw:* The yellow corn from the Department grows well in this climate, and the white corn does very well. *Clarke:* On the uplands where it has been well worked, fine; a great deal of the lowlands too wet and overrun with weeds and grass. *Montgomery:* Good, except on low swamp-land; too much rain in June for that. *Chambers:* Prospect more flattering than for many years. *Dallas:* Injured beyond remedy by continuous rain since the 1st of June. *Geneva:* Crop never better. *Lauderdale:* Badly damaged

in stands by cut-worm. It has been a hard struggle to keep the grass out (from incessant rains) and many acres are thrown out. Late, but now growing well. *Conecuh:* Looking well. *Calhoun:* Rather grassy, owing to the great amount of rain. *Marengo:* The continued rains have seriously injured corn; now too late for it to recover even with good weather. *Morgan:* On the highlands, never better. *Randolph:* Where it has been worked is splendid. *Perry:* Greatly injured by excess of rains. *Bullock:* The rain has been excessively injurious to corn. *Marshall:* Cut-worms so destructive that many fields had to be plowed up and replanted once, twice, and even three times before a a stand could be obtained. Prospect now fine. *Pike:* Continuous rains since early in May; all lowland corn is entirely lost; the upland very much injured by grass and weeds. *Limestone:* Crop about lost in weeds and grass; on many plantations it has not yet been plowed. *Tuscaloosa:* On uplands very good; on lowlands drowned out. *Wilcox:* Could not be worked sufficiently to make it ear.

Mississippi.—*Warren:* Unusually promising. *Pike:* Generally in good condition. *Newton:* Better than for many years; with favorable season, we look for extraordinary yield. *Amite:* Above average, both in acreage and condition. *Jasper:* In consequence of rain almost every day since May 1, the grass and weeds have outgrown the crop. *Marion:* Not more than three days have elapsed for the last six weeks without rain. The crop has suffered immensely. *Grenada:* Quite promising. *La Fayette:* Would be very fine but for the effects of continued rains. *Yazoo:* Having all the time too much rain for corn. *Winston:* The corn in bottoms is drowned out and will make little of anything. *Tishomingo:* In the grass; will be good. *Tunica:* Heavy rains throughout June have damaged the corn prospect. *Talabusha:* Prospect not encouraging; very grassy. *Kemper:* In the light, rolling lands, good, but in the best lands, that always make the heavy crop, very much injured by the wet weather and consequent want of work. *Panola:* Has rained almost every day for the last seven weeks; this, with increased acreage, has got the crops so in the grass that they never can be cleaned in time. *Lowndes:* Lowlands drowned out, and highlands very much injured; impossible to make more than half a crop. *Neshoba:* Looking bad, owing to the excessive rains. *Noxubee:* Much below last year. Lowlands cannot make one-third of a crop, owing to excessive rains, which still continue; uplands about an average. *Wilkinson:* Daily rains since May 12 have very seriously damaged corn; the boll-worm is damaging the corn now curing. *Madison:* Had twenty days of rain in June, making it impossible to work crops. Grass had complete control, and some of the corn-crop has been abandoned. *Jefferson:* Stalk large and fine-looking, but ears small with undue proportion of shuck. Pennsylvania yellow corn from the Department of Agriculture very fine—ears large.

Louisiana.—*East Baton Rouge:* Should the almost incessant rains since the beginning of May now cease, and labor be obtainable to meet the extra demand for work, perhaps half a crop of corn might be realized. *Avoyelles:* The low condition owing to rains nearly every day for six weeks. *La Fourche:* In fine condition the latter part of April; in the first week of May it commenced raining and continued for forty-six days—each rain a flood. The early corn very much injured, and a large part of that planted in April a total loss by reason of the rain or for want of work. *East Feliciana:* Better than the cotton. *Claiborne:* In danger of an overwhelming grass assault. *Franklin:* Early corn very good; late, promising. *Morehouse:* In excellent condition. *Red River:* Looking remarkably fine. *Tensas:* Better than at any time since I began to report. *Saint Mary:* Very much injured by constant rains in May and the first part of June. *Rapides:* After a cold and backward spring, heavy rains set in on the 1st of May and continued until the 20th of June, which entirely ruined all the last plantings of corn; the best is not more than half an average in condition.

Texas.—*Caldwell:* The great decrease in condition is owing to the excessive rain-fall for the last three weeks. *Polk:* Have had six weeks of rain. Planters have been unable to work their corn in time; there can be but little corn out. *Milan:* Crop supposed to be safe. *Dallas:* Very much damaged with an excess of water, and a rank growth of grass and weeds. *Tarrant:* Promises an abundant yield. *Navarro:* The uplands will produce a very large yield, while the lowlands will make about a half crop, which will make the crop a good average. *Kendall:* Extensive corn-planting after the disappearance of the grasshoppers and late frost, and the crop, though late, promises well, provided the rain, which has been almost incessant for five weeks past, ceases so as to permit the farmers to commence weeding operations. *Collin:* It was impossible to work corn properly in consequence of continued rains from the 20th of May to the 20th of June. *Red River:* March and April were delightful months, and heavy crops were planted in good condition. On the 5th of May it commenced raining, and up to June 20 there were but a very few days without rain. There will be some corn made on elevated spots, but on other land it is completely drowned. *Bexar:* Damaged to some extent by too much rain. *Comal:* Killed by late frost; farmers had to replant; excessive rains for the last four weeks. *Kaufman:* Acreage increased 75 per cent. over last year, but owing to the wet season the condition is 5 per cent. below. *Coryell:* Though the frost cut our corn down twice, the fine rains that set in the first

of May will cause us to make nearly a full crop. *Austin:* The fields all overrun with grass and weeds, and much of the corn-crop drowned. *Lampasas:* More rain during the last two months than for the last thirty years in Texas; corn-crop much in the weeds. *Grimes:* The very late and cold spring put corn behind, and June has been a month of rain; consequently crops much in the grass. *San Saba:* The grasshoppers were here in such quantities that we were prevented from planting corn till about the 1st of May. Consequently the crop is about six weeks behind; prospect favorable if the rains continue. *Gonzales:* Early corn was killed by frost April 9, and a succeeding drought injured the young crop, which abundant rains have since remedied. *Henderson:* Will have to be very favorable if we make half a crop of corn. *Medina:* The first planted entirely destroyed by grasshoppers; replanted after their departure, and now promises nearly an average crop. *Matagorda:* Injured by too much rain. *Montgomery:* So overrun with grass and weeds that it is now considered impossible to reclaim it to an average. *Colorado:* Doing pretty well. *DeWitt:* Very promising; acreage 25 per cent. greater than last year. *Ellis:* Much of the corn has been drowned out. *Fayette:* Good and nearly made. *Karnes:* Fine rains through June give us good crops of corn. *Washington:* Has suffered seriously from excessive rains. *Anderson:* Very favorable for corn. *Bandera:* From the third or last planting, after the grasshoppers disappeared, a tolerably good stand was secured. Excessive rains from May 25 to June 24 prevented tillage and seriously injured much corn in the valleys. *Atascosa:* The third planting has succeeded so well as to justify anticipations of an extraordinary crop. *Rusk:* Very promising on the highland; on the lowland will not entirely recover from the excessively wet weather. *Burnet:* Growing rapidly. *Marion:* Promises an abundant yield. *Leon:* Good, except in lowlands.

Arkansas.—*Hempstead:* Have had almost incessant rain for six weeks. Corn, which should have had its third working, has not yet been worked out the first time; much of it is now beginning to tassel, standing in weeds that came up with it, and not over five feet high. *Independence:* Never better. *Arkansas:* Never looked better. *Craighead:* Crops all doing well. *Monroe:* About two weeks later than usual. *Union:* In splendid condition, where it has been worked. *Woodruff:* Needing rain. *Cross:* Considerably damaged by too much rain. *Columbia:* Not doing well on wet lands owing to continued rains. *Yell:* Would have looked better if it could have been better worked. *Sebastian:* Looks well.

Tennessee.—*Washington:* Looking very well, particularly on old uplands. Cut-worms were very destructive to this crop in clover-lands. *Loudon:* More rain this June than in any previous one for years; so much that the farmers have not worked their crops as they should. Some lands so wet that they have been abandoned. *Stewart:* A considerable portion of corn-land has been so wet that it could not be planted. *Maury:* Has suffered for the want of plowing, and is now grassy. *Newbern:* Has suffered very much in consequence of the continued wet weather. *Carter:* Looks well, but too much rain. *Hawkins:* Rain has fallen so incessantly during June that the corn crop, though growing rapidly, is generally very foul with weeds and grass. *Giles:* Has a fine color, notwithstanding the unprecedented rains. *Jackson:* In grass and weeds on account of so much rain. *Montgomery:* Head and ears in the grass and no chance yet to clean it. *Obion:* One hundred per cent. more rain than last spring and summer; in some places corn is lost. Farmers have planted the same field three times. Grass and weeds are now taking the whole country. *Smith:* Left in bad condition by excessive rains. *Bradley:* Most promising. *Roane:* Have never seen a more promising crop where it has been properly worked. Those who have overcropped themselves are considerably in the weeds and grass. *Trousdale:* Generally late. May and June very wet. *Macon:* Will not make over half a crop, owing to the very wet season. *Sevier:* Never saw so fine a crop in this county before. *Dickinson:* Where it has been possible to work it looks well, but we have had heavy rains almost every day during the last month. *Humphrey:* Tall, spindling, full of sap, and very foul, owing to the continued rains. *Monroe:* Continued rains have retarded the crop, though it grows finely in the weeds. *Putnam:* Remarkably wet; corn foul, but looking well. *Wilson:* Looking remarkably well. *Weakley:* Very low. *Davidson:* Will be cut short from grass and want of tillage at least one-third. *Morgan:* Incessant rain during June has seriously injured the corn. *Fentress:* Backward; weeds away ahead. *Haywood:* Owing to excessive rains in June the crop became smothered with grass and weeds. *Robertson:* Excessive rains from May 25 to July 1 prevented plowing, and the crop is in a very bad condition.

West Virginia.—*Jefferson:* A genial rain a week ago, followed by a warm sun, is rapidly improving the corn; worms and dry weather had retarded it. *Morgan:* Rather bad start from cut-worms; will probably come out in July, as we have had frequent showers lately. *Monroe:* A fair average. *Pocahontas:* Wet weather and late planting will diminish the crop. *Cabell:* Growing finely. *Hardy:* Prospect quite favorable, but not up to an average. *Harrison:* Not very forward, but looks well. *Mercer:* Short. The grub-worm has been destructive to some fields. *Pleasants:* Very backward; light showers; now doing much good. *Braxton:* Late planted; now looking well. *Pen-*

Allen: Although planted late, now very promising. *Raleigh:* Very promising *Monongalia:* Rains during the past week fine on the corn.

KENTUCKY.—*Shelby:* Three weeks behind. *Adair:* Very weedy; cannot have a full crop; too wet to cultivate it. *Jefferson:* Promises well. *Laurel:* Very weedy; it has been necessary to plow it when the ground was very wet, and it has consequently been injured. *Butler:* So wet that corn cannot be plowed. *Fayette:* Very good. *Anderson:* Looking very fine. *Grayson:* Crop badly damaged, (by excess of rain.) *Lincoln:* Rather better prospect than usual. *Henry:* Promises a heavy yield. *Logan:* Generally looking badly for want of work; lowlands drowned out and lost because too wet to plow. *Pulaski:* In bad condition on account of excess of rain. *Russell:* Rain nearly every day in June; corn badly in the grass and weeds; many have given up portions of their crop. *Clinton:* Doing well, except that wet weather has prevented cleaning out and working it. *Johnson:* Recent heavy rains have injured the crop. *Boyd:* The acreage of corn is lessened owing to the scarcity, or rather the unreliability, of labor.

OHIO.—*Noble:* Drought has kept corn back. *Williams:* Suffering terribly from drought and worms. *Logan:* The late wet spring affected not only the acreage but the progressive condition of the crop. *Miami:* Growing very fast. *Genesee:* Growing finely; much of it late. *Jackson:* A little late; average prospect. *Medina:* Is pushing ahead. *Adams:* Rather small, but stands well on the ground, and is very clear of weeds. *Erie:* Did not come up well; very late. *Franklin:* Late, but doing well now. *Lorain:* Late; its not germinating well caused second planting. *Marion:* Much has been replanted; growing rapidly. *Morgan:* Backward. *Pickaway:* Planting late; many have but just finished; great trouble to get "stands;" causes, unsound seed, wire-worms, and ants. *Vinton:* Small but good color. *Mercer:* Late spring, bad seed, bad management, and cut-worms a great drawback on the corn crop. *Coshocton:* Doing well. *Crawford:* Late planted, and much replanted on account of bad seed; prospect fair. *Delaware:* Prospect for more than an average crop. *Geauga:* Much seed-corn failed to come up; some have had to plant the third time; late, but growing finely. *Morrow:* In consequence of poor seed, unfavorable weather, &c., many had to replant, some the third time, making the stand very uneven. *Ottawa:* Most had to plant their corn over a second time, and many three times. *Washington:* Good stand but late; growing finely. *Hancock:* Looks well. *Athens:* Backward, but of good color, and generally clean. Our best corn lands—the Hocking Valley through the center of our county—were visited on the first of the month by the most destructive flood ever known here, and all corn, wheat, and grass swept away. The loss immense.

MICHIGAN.—*Wayne:* backward, but thriving now finely. *Branch:* Very uneven and late, owing to poor seed; doing well now. *Calhoun:* Must be largely short of the usual yield. *Van Buren:* Has suffered from bad seed; many had to plant twice; also from the late drought. *Clinton:* Very generally failed to germinate; was planted two or three times. *Genesee:* Rapidly improving. *Gratiot:* Great complaint of poor seed-corn; many have planted three or four times. Ravages of cut-worms have been great in some localities; severe drought for about six weeks; fine showers the last week in June. *Hillsdale:* Doing well. *Manistee:* Luxuriant. *Mason:* Much had to be replanted, the seed having rotted in the ground; looks well. *Mecosta:* The seed that was grown last year, except what was cured in the house, failed to grow. The first planting looks exceedingly well, and the second planting is coming on and looks well. *Shawawassee:* Very late, and much injured by extreme drought. *Tuscola:* Has been injured to some extent by the cut-worm; more forward than usual. *Washtenaw:* Did not come up well; coming forward very rapidly. *Livingston:* Badly injured by the cut-worm; extreme drought prevailing. *Kent:* The stand very poor, owing to poor seed; the season favorable. *Lapeer:* A large portion of the seed planted failed to grow, and had to be replanted; exceedingly dry weather kept it back, but late rains are now pushing it forward. *Montcalm:* Farmers had to plant over two, three, and some four times, on account of the seed being damaged, as was supposed, by the cold of last winter. *Newaygo:* A large amount of corn had to be replanted, owing to bad seed; yet the condition of the crop appears to be a full average. *Antrim:* Plenty of rain and good warm weather.

INDIANA.—*Scott:* Late planted, but looks well. *Wayne:* Late planted and small, but advancing rapidly. *Huntington:* Cut-worms taking a great deal of the corn. *Ripley:* Severe drought; late planted corn will not be worth anything. *Crawford:* Later than usual, but good color and thrifty. *Decatur:* Came up badly; half the crop planted over again; many have a bad stand; three weeks late; rain needed badly. *Orange:* Corn-fields well pulverized and clear of weeds; rains light and numerous. *Owen:* Cold; backward spring unfavorable for plowing, planting, and cultivating corn. *Dubois:* Cut down in some places by the army-worm, but prospects good for a large crop. *Bartholomew:* Looks better now than a year ago, but we cannot hope for a better crop than we had in 1872. *Cass:* Backward. *Floyd:* Never was better. *Hamilton:* Small and very weedy. *Harrison:* Late, but stands good and growing finely. *Marshall:* Late planted, and seed not good; at least three-fourths of

the crop had to be planted the second time. *Martin:* Rain in the spring retarded the planting, and many fields intended for corn were not planted at all. *Newton:* Generally planted late, but looking well. *Pike:* Has improved wonderfully in the last three or four weeks. *Stark:* The crop bids fair to be as good as last year. *Franklin:* The first planting came up badly; the second well, and is doing well. *Howard:* Doing finely since it has got a start. *Knox:* Continuous wet weather; corn suffering for want of attention. *Wells:* Very backward; suffering for the want of rain. *Morgan:* Stands well, but a little short for the time. *Perry:* Late and in bad condition. *Brown:* Late planted; now growing fast. *Boone:* Planted later than usual; grew well in June; now damaged by excessive rains and storms.

ILLINOIS.—*Morgan:* Crop will be short. *Bureau:* Very backward and a poor stand, but good color and growing finely. *Sangamon:* Dry weather reduced the average. *Champaign:* Prospect not good for a large crop. *Iroquois:* In poor condition. *Jersey:* Growing fast. *Kankakee:* For the last month the weather has been hot and dry, bringing corn along splendidly. *Livingstone:* Prospect anything but encouraging. *Marion:* Good corn weather. *Pike:* Small, but promises well. *Washington:* Late; cut-worm very bad. *Whiteside:* Doing splendidly. *Carroll:* To a large extent replanted, being brought forward rapidly. *Clinton:* Late. *Crawford:* Looks well considering the late planting. *Cumberland:* Put in late. *De Kalb:* Has come forward surprisingly. *De Witt:* On low ground very far behind; on high ground looking as well as I ever saw it. *Effingham:* One-half planted in June. *Fulton:* Early planted looks well; the great amount of wet prevented planting (of a portion) till the 15th or 20th of June. *Hancock:* Looking well, and generally clear of weeds. *Lake:* Doing well, but so much had to be replanted that a full crop cannot be expected. *Lawrence:* The uncommonly wet season has interfered greatly with the crop; late planted and weedy. *Moultrie:* About one-tenth of the corn land will not be planted, owing to wet; some have just finished planting. *Scott:* Very backward. *Stephenson:* Has been backward, but coming forward remarkably well. *Tazewell:* Planted late, but growing finely. *Warren:* Generally clean and color good. *White:* Owing to the very wet season a large amount of land intended for corn will not be planted; some farmers are still planting, in the hope of a late fall. *Boone:* Very late in planting; not an average stand; now doing well. *Cass:* Planting late; chinch-bugs are damaging the crop. *Edwards:* That planted unusually good, but the low lands have been too wet to plant. *Fayette:* Backward, but growing finely. *Ford:* The prospect now good. *Lee:* All of one month behind; many did not finish planting till June 15; now growing vigorously. *Mason:* With a very late fall the corn crop of this county must be at least one-third short, owing to a cold, backward spring, and continued wet. *Ogle:* Very uneven, as much had to be replanted. *Piatt:* A good portion late, but doing very well. *Franklin:* Replanted late; very small: much of the crop destroyed by the army-worm; the remainder very excellent.

WISCONSIN.—*Clark:* June very propitious. *Juneau:* Looking splendid. *Pierce:* Growing very fast. *Portage:* Backward and weedy, but good color and rank. *Richland:* Very weedy, owing to the wet weather. *Walworth:* Recently looking up, as if to make up for lost time. *Dodge:* Looking well. *Milwaukee:* Put into the ground late, but now coming on finely. *Calumet:* The seed in some localities rotted; the replanted prosperous. *Dane:* Prospect better than in any year since 1859. *Iowa:* The decrease in acreage is mainly owing to poor seed, which failed to grow; where the seed was good the crop looks well. *Eau Clair:* Shows a rapid growth. *Green:* Never looked better. *Saint Croix:* Some fields as good as last year at this date, but not generally.

MINNESOTA.—*Blue Earth:* Spring late and wet; a great deal of corn plowed up, and the ground sown to flax. *Nicollet:* The continued wet weather has materially affected our corn crop. *Sibley:* Heavy and continuous rains have spoiled 25 per cent. of our corn crop. *Fillmore:* Backward, but looks well. *Kandiyohi:* Growing fast. *Faribault:* The long-continued rains in May and June caused much of the corn planted to rot, and hindered many from planting and replanting the same. *Freeborn:* Has made a very rapid growth. *Ramsey:* Looks very fine.

IOWA.—*Woodbury:* Several flooding rains have interfered with the stand and retarded the growth. *Montgomery:* Prospect flattering. *Calhoun:* In low land did not come up well on account of the wet. *Guthrie:* Rather late, but fine weather is bringing it out wonderfully. *Harrison:* The acreage of corn increases rapidly each year as immigrants come in. The season has been so wet and backward that corn is not doing as well as usual. *Polk:* Late in planting: some ground not put in and will lie out this year, *Story:* Spring cold and wet, but now corn growing fast and looks finely. *Decatur:* Clean and in very good condition. *Delaware:* Pushed forward with remarkable rapidity. *Floyd:* June remarkably favorable for corn; the stand good. *Poweshiek:* Very uneven: some looks well, and some not half a stand and full of weeds. *Shelby:* Thirty-three per cent. on bottoms drowned out. *Pattawattamie:* The usual amount not planted on account of wet weather; growing finely. *Cherokee:* Rather backward; the hot weather hastening it along. *Des Moines:* Prospect fair. *Grundy:* The wet season has seriously injured the prospect for corn. *Lee:* Clean and

a good stand. *Monona:* Acreage and condition reduced by the vast amount of rain. *Chickasaw:* Has come on beyond all precedent.

MISSOURI.—*Wayne:* Late. *Cass:* Extra. *Chariton:* Planted late and looks poorly. *Caldwell:* Late planted growing prodigiously. *Jackson:* Wherever it has had proper attention promises well. *Adair:* Prospect never better. *Bates:* Looking better for its age than I ever saw it. *Bollinger:* Growing finely, but some fields foul owing to the wet weather. *Boone:* Except a few localities, very promising. *Harrison:* Excellent prospect. *Jasper:* Chinch-bugs have left the wheat and are moving *en masse* on the corn and oats. *Lincoln:* Very small, but looks well. *Moniteau:* Never promised better. *Pulaski:* Looking very well, but attacked by chinch-bugs. *Ralls:* Young, but looking well. *Reynolds:* If it were not for the rain, which keeps the corn growing very fast, the chinch-bugs would do a great deal of damage. *Worth:* Prospect never better. *Clay:* Planted late; has had a favorable season and promises well. *Howard:* Very backward, but, if seasonable, will make a heavy crop. *Ozark:* Looking very unpromising, but the warm weather and frequent showers of June have given it an excellent start. *Phelps:* The chinch-bugs are going for the corn. *Putnam:* Promise of abundant crop. *Shelby:* Prospect of abundant yield. *Sullivan:* Put in the ground late, but favorable weather has brought it nearly up to a fair average. *Vernon:* The chinch-bugs are now taking the corn; great loss is apprehended. *Pemiscot:* An extraordinarily wet season; corn in the grass much more than other years. *Barry:* The cold weather retarded planting and caused it to come up badly. *Schuyler:* Prospect remarkably good in the regular stand and the cleanness of the ground. *Wright:* Looking well except the early variety.

KANSAS.—*Douglas:* Has a poor stand and is backward. *Leavenworth:* Looks very well. *Butler:* Weather very dry; corn suffering. *Coffey:* A large quantity of land intended for corn will be sown in millet, buckwheat, &c. With fine weather the crop of corn may become as good and large as last year. *Davis:* Good with the exception of being blown down by violent storm. *Woodson:* The high water drowned the crop in the bottom-lands, and the excessively wet weather, in May, kept the farmers out of their fields until the weeds took what the water left. They have just finished replanting. *Cherokee:* Looking well, though backward; in fields adjoining wheat the chinch-bugs are beginning to work. *Dickinson:* Have not had a better prospect for the last twelve years. *Howard:* The chinch-bug troubles some late-planted corn. *Linn:* Excessive wet cut short the corn-crop in acreage and made it difficult to keep it clean, but nearly every farmer runs a two-horse cultivator, and so they are getting the weeds reduced. *Labette:* Would be an average crop were it not for the ravages of the chinch-bugs. Any amount of corn in the county that was knee-high one week ago is now dead. Have seen stalks, 20 inches high, clear of a bug in the morning at 6 o'clock, at 6 in the evening literally black with bugs all around and two or three deep. *Neosho:* The chinch-bugs are now going for the corn, and have already materially injured the crop. *Osage:* Mostly planted very late. *Rice:* A very hard storm, June 30, blowed the corn down very badly. *Sedgewick:* Too wet to cultivate corn to advantage. *Shawnee:* Uneven and some late; the early fine. *Sumner:* Some fields very weedy on account of wet weather; growing finely. *Washington:* Though planted late, is well advanced by the exceeding warm weather. *Republic:* About two or three weeks late, but doing well. *Jefferson:* Owing to wet weather it has been extremely difficult to secure a fair stand of corn, and much of that coming up well has been abandoned to the weeds; such as has been cleaned out is doing remarkably well. *Pottawatomie:* Choked by weeds owing to the ground being so wet that the farmers could not cultivate it.

NEBRASKA.—*Hall:* In consequence of one heavy rain-storm after another the greater portion of corn was planted in June, and some of our best bottom-lands not till June 20. *Merrick:* A good deal of corn was planted between the 15th and 25th of June. *Boone:* Excessive moisture has retarded the growth of corn; the acreage much decreased in proportion to the increase of population. *Nemaha:* The low price deterred many from planting the usual quantity; the late spring retarded planting, and the cool rainy weather has caused that planted to become very foul. *Clay:* The bulk not planted till June; though not as forward as usual, the prospect is good. *Richardson:* In low places rather weedy. *Cass:* Very late and in rather bad condition. *Burt:* Backward on account of rains, late planting, and grasshoppers.

CALIFORNIA.—*Fresno:* Grasshoppers are injuring the crop. *Butte:* Only a little corn raised.

OREGON.—*Multnomah:* No better prospect for the last thirteen years. *Clackamas:* The cool weather has retarded the growth of corn. *Douglas:* Corn did not come up even. *Columbia:* The weather has been too cool and cloudy for corn; it looks sickly. *Linn:* In a better condition than ever before.

UTAH.—*Utah:* The cold rains and frosts, the last of May and first of June, rotted the corn in the ground. *Davis:* The excessive rain in the latter part of May was very injurious to corn; many had to replant.

COTTON.

The total area in cotton in 1872, as estimated by this Department from the most accurate information attainable, was 8,500,000 acres. The returns for this year indicated an increase of about 12 per cent. The breadth planted was quite enough to tax to the utmost all available labor under the most favorable circumstances. But throughout the cotton States, for a period varying from twenty-five to thirty-five days, according to locality, and ending between the 20th and 30th of June, the weather was wet beyond precedent. Furthermore, for reasons reported in June, the crop was generally from two to four weeks late. The large area planted, the lateness of the crop, and the almost incessant rains, for weeks preventing work and stimulating the growth of grass and weeds, have combined to produce a demand for labor which it is impossible to meet. A few reporters complain of the unreliability or the laziness of the freedmen, but the majority of those which refer to the subject give them credit for doing better this season than heretofore, and place the difficulty on the ground of a demand for work which the laborers in this section, even with their best efforts, are too few to meet. In consequence of this excess of rain and lack of labor, weeds and grass have been overshadowing the cotton-plant in every State and in almost every county reported. The area that for this reason has been either abandoned outright or plowed up and planted in corn will probably nearly equal the excess over last year's acreage. The reports, with few exceptions, are despondent in tone and picture a somewhat gloomy prospect. But they doubtless are not fully exempt from the common tendency to exaggerate the bad effects upon crops of unpropitious weather prevailing in the present, and to underrate the future chances of recuperation from those effects. It would be safe to make some grains of allowance for this—transferring them from the discouraging to the hopeful side of the harvest-prospect. The last days of June were generally favorable, and the condition was, in many locations, already beginning to assume a more promising aspect. Cotton-worms, caterpillars, and lice had appeared in small numbers at several points, but as yet had not done serious damage. The average condition for all the cotton States, (not counting Virginia,) as made up from all the counties reported, was 89.5. Ten counties reporting from Virginia make the average condition 108. 2 being placed at 100, 6 above, and 2 below. Princess Anne, 150; Sussex, 120, in which "the condition as compared with last year is owing in great measure to the more general use of the best fertilizers." In Southampton, 110, "cotton seems to have absorbed all farming interest, even at the expense of grain." In Prince George, 90, "the cold, wet May retarded cotton-planting; much planted early had to be replanted; now a fair stand, but the plants small."

In North Carolina, 43 counties make the average condition 91; 14 are placed at 100, 7 above, and 22 below. The extremes are Polk, 125, and Montgomery, 25. Harnett and Cumberland report 70; Onslow, Surry, Greene, Pasquotank, and New Hanover, 75. The difficulties which most of the counties have to contend with are briefly stated in the report from Chowan: "Looking bad; cool weather, heavy rains, and a scarcity of labor have caused large fields to be abandoned. Too much planted; labor cannot be had; $1.50 and $2 per day have been paid for farm-hands." Franklin is either more industrious or better supplied with labor than the average, for it reports, "generally clean and well cultivated." Other extracts follow:

Sampson: Small, but coming out rapidly. *Pasquotank:* Owing to the cool late spring and excessive rain since, it looks now as though we might not raise a half crop. *Mecklenburgh:* Heavy rains in May, and want of labor have caused some fields which were well prepared by fertilizing and otherwise to be abandoned. Hands leaving farms and going to railroads, after contracting with the farmers for the year, will prove a serious loss to our farmers. A larger amount of fertilizers has been sold this year than ever before. *Gaston:* Owing to the too showery weather it has cost an unusual amount of labor to keep cotton clear of grass; a very small part will be wholly lost. It is now improving. *Cumberland:* Fifteen days behind average season; prospects gloomy. *Davidson:* The extreme wet weather has greatly injured the crop. *Currituck:* The acreage, as compared with last year, is 200; looking well and promises a good crop. *Anson:* Beginning to look well, though small and backward. From the long-continued wet season and scarcity of labor, many fields were either turned out or plowed up and planted in corn; the acreage reduced 10 per cent. *Pitt:* Recent dry weather has enabled farmers to get clear of grass, and hence cotton has reached an average condition. *Beaufort:* Small for the season, but generally in good condition and healthy. *Moore:* Late; with favorable season henceforth will be an average crop. *Polk:* So much rain all through June that farmers are very much behind in their work with cotton. *Stanley:* The plant so far has met with no disaster, and the growth is thrifty. *Burke:* Our farmers are trying cotton for the first time as an experiment, and the prospect is very favorable.

In South Carolina the condition of only one county among the 16 reporting comes up to average, the general average condition being 82. The range is from 70 (Williamsburgh and Chester) up to 100, (Laurens.) Greenville reports "more planted than can be worked." Chester, that "some have lost one-half for the want of efficient labor." York, that "the increased acreage and the excessive rains have rendered proper cultivation almost impossible," and Laurens, that "there has been about 40 per cent. more guano than usual used, and this has given a great impetus to the grass. One-tenth of the crop in this county will be lost from this cause."

Clarendon: Decidedly poor; excessive rains in May and first two weeks in June retarded the growth of the plant, but caused the grass to grow vigorously, and to some extent exhausted the value of the fertilizers used. *Chester:* Excessive rains through May and up to June 14 caused farmers to abandon one-eighth to one-fourth of the crop to grass and weeds. Crop fifteen days behind last season. *York:* In cases where proper attention has been bestowed the appearance is good, though not up to last year's at this date. The spring has been cold and wet, and the growth much retarded. *Newberry:* At least three weeks behind the usual season. The continued heavy rains, almost daily, have caused portions of the crop to be abandoned on most plantations; a scarcity of labor on most farms. *Laurens:* The cold spring kept the cotton from coming up, and the continued showery weather has caused the grass to grow rapidly and kept the laborers from the field. *Barnwell:* Stands are deficient, and the plant does not look as well as usual. *Georgetown:* Is being cultivated, but as yet on too small a scale to be considered one of our staples. There is no doubt that it will pay better than corn on our sandy lands, and the area of cultivation will be increased. *Greenville:* From 3 to 12 inches high; growing very slowly; more planted than can be worked. *Marlborough:* Three weeks late; on account of late frosts and heavy rains the stand is not good; the grass has taken at least 10 per cent., and injured the remainder. Labor is very short. *Richland:* Very small and grassy; fears that much will be abandoned, probably reducing the acreage below an average. *Fairfield:* The month of May and part of June very wet. Good stands the last of April, but since then perhaps the hardest struggle with grass ever known in this county. *Chesterfield:* On some land highly manured, where cotton was 4 feet high last year at this time, it is not more than 20 inches now. *Union:* Too much rain and too much grass; about two weeks later than last year. *Williamsburgh:* Better than at last report, but not yet free from grass, and still much below the average. *Orangeburgh:* One month behind, and the stand much injured by cutting out the grass. *Marion:* Backward; defective stands; badly in the grass. The weather now favorable to culture and growth.

In Georgia, from which 58 returns have been received, the average condition is 94; 17 counties are 100, 10 above, and 31 below. The condition in Douglas County, which is about a specimen for the State, is described thus: "Farmers are very much in the grass on account of too much rain and overcropping themselves. Some have been compelled to give up cotton-fields, even those on which they had used guano."

But all do not yield to discouragement. Many are battling courageously with the grass, and victory with its rewards is anticipated. Sumter reports: "Raining almost daily for a month, and a great deal of grass, but our planters are straining every nerve, and ten days of sunshine would enable them to put the crop in good condition." The account in Heard is: "An exceedingly wet June, and grassy crops, but every farmer seems determined to work it out, and I think they will succeed." In Whitfield, 125, "The farmers have cultivated their crops well, and cotton was never more promising." In Schley, "Labor is working well;" and in Hart, though "Cotton is generally in a deplorable condition, not having been cleaned of grass in time, the area is so much larger than in previous years that the probability is yet good for a fair average crop." Pickens returns a condition of 200; Gordon and Madison, 125.

Worth: The floods have nearly ruined cotton. *McDuffie:* Since last report it has rained every week, and sometimes every day in the week. Consequently cotton is in a worse condition than for twenty years at the same season. In many instances the grass has choked out the cotton, and there is not over three-fourths of a stand in the county, and that three to four weeks late. *Upson:* Acreage large; prospect fine for a good crop. *Schley:* Owing to the continual rains, up to June 18, it is very grassy. The caterpillar has appeared in some localities. *Richmond:* Wherever worked early and well, the condition above that of the crop of 1872 at this date. Crops on lowland badly damaged by grass; many fields have been abandoned. No signs of caterpillar. *Lee:* Generally in the grass, after three weeks of rain. *Clinch:* The heavy rain during June has cut off the cotton crop fully one-third. *Oglethorpe:* The unfavorable condition of the crop is owing to the unprecedented wet weather in the last half of May and the first half of June, coupled with the fact that a fuller crop than usual to the land was planted. In some cases the grass is larger than the cotton, and not yet hoed. Some will be abandoned entirely. *Gwinnett:* Land too wet to be stirred; hence crops grassy, and in many cases materially injured. Cotton, where worked, looks well. *Brooks:* An unusual quantity of rain the past month has been damaging to the cotton-crop. *Clayton:* Owing to the wet weather farmers have had a tight scuffle with the grass, and some will lose a part of their cotton-crop. *Marion:* The crop has been injured by too much rain and an overcrop of grass. *Macon:* The almost incessant rains have prevented work and promoted the growth of grass and weeds, and the cold nights have caused lice. *Putnam:* Looks well. *Spalding:* Great diversity of opinion as to cotton; everything at work to keep down the grass. *Twiggs:* Very small, poor stands, and in bad order. Rain twenty-three days in June. It has been impossible to work the crop. *Walton:* Injured by excessive rain and grass. *Greene:* Heavy rains have fallen for about two months, and much cotton has not been chopped out yet. The crop will be very short. Some upland is very fine, while some grounds have been abandoned. *Laurens:* The continued heavy rains have made it impossible to keep crops clean; a good deal of cotton will be abandoned. *Coweta:* Where it was worked early and regularly looks well. Some has been thrown out, and very much has been injured for the want of work and by lice. *Calhoun:* Three weeks of rainy weather have caused the cotton to become lousy and badly in the grass. *Muscogee:* In a very unsatisfactory condition; stand only tolerable; grassy, small, and three weeks behind. *Effingham:* Improving and looks very well. *Wilkes:* Grass now almost in possession of cotton; some fields not worth working out; have been but few clear hot days to kill the grass. *Dooly:* Early cotton just beginning to bloom, but affected somewhat by recent heavy rains. *Baldwin:* Rains almost daily in June; much of that month the soil was too wet for plowing, and the grass has obtained the mastery in many of the plantations, reducing the cotton to 80. *McIntosh:* Crop much injured first by the long drought, and since by the heavy rains. *Pike:* Prospect unusually poor, owing to the excessive and long-continued rains; hundreds of acres have not been thinned out. *Milton:* Owing to heavy and continuous rains throughout May and June, cotton has been overrun with grass, and many fields have been plowed up and planted to corn, or turned out. *Franklin:* Lice on cotton to a considerable extent. *Carroll:* Quite small on account of the long wet weather. Farmers have had great trouble with wet, lice, grass, and weeds. *Cobb:* The late spring and an unusual amount of rain have done much injury to the cotton-crop. *Fayette:* Greatly injured by grass, and a considerable portion has been abandoned; cannot possibly make more than two-thirds of a crop. *Wilkinson:* Small and in the grass.

From Florida only 10 counties have reported, making an average condition of 99; the extremes being Sawannee, 75, and Liberty, 150. In

Madison the acreage is 25 per cent. greater than last year. In Leon and Columbia caterpillers have appeard in some localities, but have not done much damage.

Madison: Running too much to weeds, in consequence of rain. *Orange:* Looks well. *Jackson:* The plant fully up to the season, with good size, and blooming freely; the grass, however, is quite troublesome, and keeps planters busy. *Hamilton:* Doing well; no caterpillars yet. *Leon:* Doing tolerably well; excessive rains for the whole month have made the crop grassy. It is fruiting well, and not shedding yet. *Columbia:* Too much rain for sea-island cotton the past month. *Gadsden:* The deterioration in condition since the last report is in consequence of the excessive floods of rain, preventing proper cultivation and inducing the prevalence of lice.

From Alabama, 6 counties return average condition, 3 above, and 27 below; making a general average of 85. Geneva, 125; Walker, 115; Saint Clair, 110; Franklin and Limestone, 50; Wilcox, 55; the others, from 75 up to 100. In Franklin, "for five weeks there have not been more than five days in which it was dry enough to plow. A good deal of cotton has been plowed up and the ground planted in corn." The status is somewhat similar in a large portion of the counties. In Bullock, "it is estimated that at least one-fourth of the acreage has been lost because of the overflow of bottom-lands and the destruction of the stand in cleaning the crop of grass." In Limestone, "a great deal has not yet been chopped out, and large planters have abandoned, some one-half, some one-third, &c." Lauderdale reports, "badly injured in stands by cut-worms;" Clarke, "some caterpillars;" and Tuscaloosa, "caterpillars in one locality." In Perry, "labor has been more faithful than usual, and the crop has shown decided improvement in the last week."

Jackson: Growing rapidly, but very weedy. *Barbour:* The rains for the last thirty days have been terribly destructive to cotton. *Blount:* Very promising. *Hale:* Rain has been falling in torrents for the last six weeks, so that the cotton is overrun with grass. Have not seen it in such bad condition, at this season, since 1866. *Choctaw:* Abundance of rain and crop very grassy. *Macon:* Seriously injured by heavy rains. The grass has taken all the lowland and much of the crop will have to be turned out. *Greene:* Very much damaged by too much rain. Labor not sufficient. *Crenshaw:* June extremely wet and the crop suffering for want of work; has commenced blooming, and may make an average crop. *Clarke:* Too wet for cotton; overrun with weeds and grass. *Montgomery:* Backward and in the grass, but healthy. *Chambers:* In the grass on account of so much rain, but farmers are busy in getting it out. *Coffee:* Having too much rain for cotton. *Dallas:* Continuous rain since the 28th of May has very much injured the cotton. The condition may be regained, but many fields are likely not to be reclaimed from grass. *Geneva:* Crop never better. *Perry:* Greatly injured by excess of rains; on the flat lands the water has injured the crop at least 10 per cent., while throughout the county it has suffered for work; every farm being more or less in the grass. *Butler:* Very backward; materially injured by excessive rains in May and June. The farmers not able to keep the crop clear of grass; in some places portions are abandoned entirely to it. *Marshall:* Foul, by reason of the continued wet weather. *Pike:* Much lowland cotton lost; the upland injured by grass and weeds. *Limestone:* Cotton ten or fifteen days late, and most of it lost in grass. *Lauderdale:* The rains have been so incessant since the middle of May that it has been a hard struggle to keep the grass out, and many acres are thrown out. *Winston:* Heavy rains prevailing since June 13 have retarded the rapid growth of cotton. *Conecuh:* On highlands where it has been worked, looking well; all damp lands lost in the grass with no hope of extricating it. *Calhoun:* Rather grassy, owing to the great amount of rain. *Marengo:* Some are plowing up their grassy cotton to plant more corn; on uplands where it has been well worked it is promising; but much of it on the richest land is so foul that it will either have to be abandoned, or, if worked, will be much injured in the stand. Hear of the worm in some localities; it still rains every day. *Morgan:* Rain more or less every day for three weeks; crops very much in the grass, and some on the very low lands are drowned out. *Randolph:* Where clean looks very well, but the farmers are badly in the grass and not much prospect of getting out soon. *Saint Clair:* The wettest June I ever saw. If the rain continues much longer cotton will be ruined by lice and other insects. *Tuscaloosa:* On uplands very good; on lowlands drowned out. *Wilcox:* Continuous rains for the past two months: impossible to secure cotton stands and kill the grass.

In Mississippi 31 counties make the average condition 83, 8 being 100, 2 above, Newton 150, and Hinds 105; and 21 below, the lowest being Marion, 58, and Jefferson, Claiborne, and Pike, 60; the others ranging from 75 upward. Newton reports, "the very high condition is not too high for the facts; we have had a vast deal of rain, and farmers are to some extent in the grass, but are working out." The extremes of condition, as affected by labor or the lack of it, are stated in the returns from Neshoba and Noxubee: in the former, "where it has been well worked, looking very well;" in the latter, "much in the grass; one-fourth of the crop must be turned out."

Yalabusha: Very grassy; a good deal being turned out, planters finding it impossible to work it. Prospect rather gloomy. *Kemper:* In the grass, and a considerable share of what is planted will have to be turned out. Continuous rains all through May and June. *Panola:* Very late and grassy; poorest prospect for twenty-five years. *Lowndes:* Lowlands drowned out, and highlands very much injured by rain: crop at least a third below average condition. *Wilkinson:* Daily rains since May 12 have very seriously damaged cotton; full of grass and weeds. Caterpillar reported in several parts of the county. *Claiborne:* Suffering from excessive rains. *Madison:* At least one-fourth of the crop in the bottom-lands has been abandoned in order to save the remainder. *Jefferson:* Stalk, where well cultivated, larger than at the same period last year—more sap and less fruit. *Holmes:* Backward. Continued rains have kept the crop in the grass, and many planters have not yet finished hoeing it out the first time. *Warren:* Owing to frequent rains in June many of the fields are grassy. The plant has grown rapidly, but the number of forms is not in proportion to size. *Pike:* The continued rains have put the fields so in the grass that the prospect is very gloomy; it is impossible to get the fields in a condition to make a good crop. *Amite:* Above average in acreage and condition; having too much rain. *Jasper:* Since May it has rained more or less almost every day, consequently the grass and weeds have outgrown the cotton, which is almost covered with foulness. It is said that the cotton-worm is on many plantations in the county. *Marion:* The crop has suffered immensely from rain; not more than three days have elapsed for the last six weeks without it. The cotton-worm has made its appearance in great numbers; all anticipate the destruction of the crop by the last of July. *Grenada:* Cotton worked out up to this time has a fair average prospect; but an unusual amount of it is still in the grass and unworked for the first time. *Lee:* More planted than ever since the war, but the worst prospect ever seen; not a bloom seen yet. Causes, late planting and too much rain. Some crops not yet worked over for the first time. *Smith:* Prospect not favorable on account of incessant wet weather. *Bolivar:* Prospect very poor, though better than two weeks ago. There are a few not yet through hoeing over the first time, owing to the wet weather. *Clark:* The great amount of rain in May and June has caused many planters to lose a considerable amount of the cotton planted—at the lowest estimate, 15 per cent. Some have plowed up what they could not work out and planted corn. *Lafayette:* Looks well, but owing to continued rains is in many plantations very grassy; some has been abandoned. *Yazoo:* Having all the time too much rain for cotton. *Winston:* Has rained almost every day since the 1st of June; many farmers are not able to work out their cotton in the bottoms, and have given up a part as lost in the grass. *Tishomingo:* Rain every day in June but four. Cotton in the grass; lowlands given up; will perhaps be something over half a crop. *Tunica:* Heavy rains throughout June have damaged the prospects of cotton; the farmers have struggled hard, but in some instances have lost a part of the crop in the grass.

In Louisiana three parishes report a condition above average; Winn, 105; Richland and Union, 110; and in the latter "the prospect of a large crop better than in any year since the close of the war." Tensas returns average, and the others reporting, below; the lowest being Cameron and East Baton Rouge, 50; and Carroll, Rapides, Red River, Claiborne, and Avoyelles, 75. In East Baton Rouge "a great deal will have to be abandoned entirely, being drowned out by the rains and overcome with the grass." The report from Iberia (60) concludes: "Have now had eight days without rain, and planters are working vigorously to relieve their crops from weeds and grass." The caterpillar is reported on several plantations in West Feliciana, and worms have made their appearance in Concordia and Cameron. In Red River though the condition is placed at 75, the crop "is looking remarkably

fine;" and in Tensas, though rains in June brought out the grass and threatened the crops very seriously, yet, "by a tremendous effort all around, the grass was exterminated, and the crop now promises even more than last year." The general condition is 80—lower than in any other State, except Texas.

Avoyelles: Low condition, owing to rain nearly every day for six weeks. *Orleans:* A shower of rain almost every day in the last six weeks; grass and weeds are well in the ascendancy. *Iberia:* In certain portions of the parish almost totally destroyed by hail during the latter part of May; much had to be replanted. *Caddo:* June very wet; cotton grassy and backward. *East Feliciana:* Has rained almost incessantly since the 1st of May, and many crops are almost hopelessly in the grass; but if we escape the worm we may yet make a fair crop. *Claiborne:* In danger of an overwhelming grass assault; persistent rains during the month of June. *Franklin:* Promising, but more grassy than usual on account of continual wet weather. *Morehouse:* Five weeks of rain, and therefore cotton badly in the grass; the ground too wet to plow. *Tangipahoa:* Constant rains; a good deal of cotton lost in the grass; the cotton-worm has appeared on many farms. *West Feliciana:* The weather has been very rainy, and the crop is badly in the grass; the stand is not good. *Concordia:* Constant rain for three weeks in June: bottom crop of cotton very short, yellow and scalded; crops three weeks behind, and worms three weeks ahead. *Carroll:* In bad condition owing to so much rain. Planters have not been able to work at all in many places. Some few have thrown away as much as half to try to save the other from grass. *Rapides:* Very small and much of it already thrown out; the remainder cannot be cleaned out in time to make half a crop. *Cameron:* Excessive rains from the last of May through June caused crops to suffer from drowning and scalding. The cotton-worms appeared in May, and are now abundant. The prospect for a crop poor indeed. *Bossier:* Vast quantities of rain. Most of the laborers have kept their crops clean; those who have not have a very poor crop; but crops on the average are better than for several years.

In Texas the cotton-crop has had to contend with a cold, backward spring, late, severe frosts, and excessive rains, protracted beyond precedent. Fifty-one returns make the average condition for the State only 78. Two counties are 100, 9 above, and 40 below. Those above are Hill and Collin, 125; Tarrant, 120; Comal, 115; Orange and Sabine, 110; Medina and Karnes, 105. Rusk and Anderson, 100; Kendall (not credited with any cotton in the last census returns) reports a condition of 7 only; Blanco, 35; Montgomery, 40; Leon, Cooke, Fort Bend, Matagorda, Colorado, Red River, and Austin, 50. Austin reports that there have been five weeks of rain; that the fields are all overrun with grass and weeds; that much of the crop has already been abandoned, and that it is at least one month late. Furthermore, "the first brood of worms has commenced webbing up, and should the second brood appear in large numbers within the month of July almost no crop will be made." Our reporter in Fort Bend says: "Owing to late frosts and about forty days of consecutive rains from about the 10th of May, cotton is comparatively a failure in this part of the State. Level, black lands are drowned out; from 200 acres of such land, planted by the writer, not one acre will be saved. The highest estimate made for the county is one-fourth of a crop." Lavaca reports that work has been prevented by heavy and incessant rains since the 1st of June, and, in consequence of grass and weeds, "fully three-fourths of the crop will be lost."

Bell: The heavy rains nearly every day for the last four weeks have materially impaired the crop. *Caldwell:* The great decrease in average condition is owing to the excessive rain-fall for the last three weeks. It has promoted the growth of grass and weeds, and prevented the farmers from working their crops. *Polk:* Have had six weeks of rain; cotton may possibly come out in time to make three-fourths of the crop of 1872. *Milam:* A month later than last year and greatly in the grass and weeds. Frost continued late, then dry for some time, and now entirely too wet. Prospect rather unfavorable, but hope for a good crop yet. *Dallas:* Much of it will not be cleaned out, being entirely overgrown with weeds and grass. *Tarrant:* Looks well. *Navarro:* The crops on low or level lands are in bad condition; on rolling lands very good. If the weather continues good the cotton crop can be saved. *McLennon:* Late frosts, with the rain which has been without a precedent for ten years past, makes all

crops backward. *Kendall:* Very late. *Red River:* There will be some cotton on very clean land, but as a general thing the cotton is run away with grass and weeds. *Bexar:* Damaged to some extent by too much rain. *Comal:* Late frost in the spring killed the cotton, and farmers had to replant. Owing to this, and the excessive rains for the last four weeks, it is impossible to estimate the crop. If the fall should be favorable it will be average. *Kaufman:* Many fields too wet to work and 10 per cent. thrown out. *Coryell:* The plants look fine, and if the season holds out more cotton will be made in this county than ever before. *Grimes:* Much in the grass; if the rain continues we shall not make half a crop. No season can now make it exceed 75 per cent. *Lamar:* Retarded by the backward spring; when the young plant was straggling for existence—just getting up after frost—several hail-storms almost destroyed the crop in about half our county; after which continual rains for seven weeks prevented the farmers from clearing it of grass. *Upshur:* Started fine, but the late rains have put it in the grass. No doubt a considerable quantity will have to be abandoned in order to save the remainder. *Gonzales:* Quite late, and being injured by excessive rains. *Henderson:* Has rained almost every day; will have to be very favorable if we make half a crop of cotton: can hardly see it for the grass and weeds. *Medina:* Improved by abundant rain-fall. *Matagorda:* Small, and a great deal injured by grass and weeds. *Montgomery:* So overrun with grass and weeds that it is considered impossible to reclaim it all; many have entirely abandoned their crop: the bottom-land cotton is a total failure. *Colorado:* The wet season has taken the cotton crop; with hard work may be half a crop. *Ellis:* Much of the cotton has been drowned out. Rain lasted thirty-seven days, during which no work was done, and a great deal has been abandoned; cannot make a half crop. *Fayette:* Large, and with a favorable season from this time will be a large crop, provided the caterpillar does not come too soon. *Galveston:* All sea-island cotton in this county; crop very backward; rains excessive; second crop generally planted; worm has appeared on a few plantations, but not done much damage yet. *Karnes:* Rather too much rain for cotton, and reports of the worm have reached us. *Washington:* From the 10th of May to the 20th of June excessive rains almost daily; cotton has suffered seriously; in low places plants scalded, and all more or less injured by weeds and grass. *Anderson:* June exceedingly rainy, preventing cleaning and retarding the growth of cotton. *Waller:* Twenty to thirty days behind last year on account of frost April 10, and continued rains through the last of April, and May, and June. *Rusk:* On the high-land looks well: on the bottom-land it turned yellow from wet and grass. The first blooms on the 21st of June. *Burnet:* At least four weeks backward, but growing finely now. *Marion:* Seriously damaged by excessive rains; farmers not being able to keep down the grass. *Cooke:* Rained from the 24th of May to the 9th of June so constantly that everything got foul; much cotton abandoned to the weeds. *Hunt:* The acreage of cotton will necessarily be decreased, many farmers having abandoned a portion of their crop to the weeds. *Hill:* The late spring and great amount of rain since have put cotton back three weeks; the prospect now good, though late. Increase in acreage 23 per cent. *Leon:* From present indications we will not make half a crop, it having rained almost every day from the 10th of May to the 20th of June. While a portion is in good condition, much will have to be turned out from the fact that it has not had the first working. *Panola:* Very promising.

Twenty-nine cotton reports have been received from Arkansas. Making allowance for Newton, which returns the extravagant condition of 500, but which reported no cotton for the last census, the average condition is about 96. Sharp returns 125; Arkansas, 120; Van Buren, 105; 9 return 100, and 16 below that figure; the lowest being Hempstead, 50; Cross, 70; and Montgomery, 75. Hempstead, though reporting a condition of 50, "almost incessant rains for six weeks," and that "cotton has not been worked out the first time," predicts that it may "possibly make a fair crop yet." In Independence, notwithstanding the late planting, the plant has "attained the usual size at this date, and at the same time a vigor and health never surpassed in the county." In Arkansas it "never looked better;" in Craighead it is "doing well;" in Woodruff, where it was "very dry all through June," it is "not as large as usual, but clean and better cultivated;" and in Fulton it was backward, but "has sprung forward with extraordinary vigor and growth, and no drawback except a few cases of cotton-lice."

Monroe: About two weeks later than usual. *Union:* Rain almost every day since planting; a great deal of cotton replanted; badly in the grass; will improve soon as dry weather sets in; labor improving. *Prairie:* Excessive rains have retarded and in-

jured all the crops; with favorable weather, cotton may reach an average. *Jefferson:* The continual rains for the first three weeks of June have kept cotton in the grass, injuring the crop, and causing bad stand from the almost impossibility to get laborers. *Bradley:* That portion which has been well tilled is far above an average, but, owing to late continued rains, a considerable portion is in the grass. *Dorsey:* Excessively wet weather during the past two months has seriously injured the cotton-crop. Thousands of acres are so overrun with grass and weeds that it can never be cleaned out. *Cross:* Damaged by too much rain. *Columbia:* Looking well on all dry land, badly on wet, and much still in the grass. *Crittenden:* Too much rain, and plenty of grass. *Drew:* The excessive rain-fall since the middle of April has rendered it impossible to give cotton the requisite cultivation, and caused many to abandon a part of their crop. *Yell:* A little later than usual; all that has been worked since the dry weather set in looks better than usual, though there is a great deal in the grass yet. *Sebastian:* Promising a good yield. *Montgomery:* In consequence of so much wet, the cotton-crop is in a wretched condition, overrun with grass and weeds. Many fields have been plowed up and planted in corn, and others given up to the grass.

Twenty-four counties in Tennessee return an average condition of 96; 7 at 100, 5 above, and 12 below. Wayne, 125; Wilson and Hardin, 120; Davidson and Humphrey, 110; Bradley, 50; others from 80 up to average.

Maury: Properly worked, would have been over an average. It has suffered for want of plowing, and is being injured by grass. *Newbern:* Has suffered very much in consequence of the continued wet weather; much of it very grassy, and will be late in maturing. *Giles:* Has been plowed up by several; that remaining can scarcely be seen for weeds and grass, but has a fine color, notwithstanding the protracted and unprecedented rains. *Obion:* Suffering for the want of work; the ground has been so wet it is impossible to work it. *Scrier:* But little raised here: what is looks well. *Henry:* Generally suffering on account of grass and weeds; in low lands, in many instances, the crop is abandoned. *Weakley:* Have had more rain during the past two and a half months than was perhaps ever known to fall here in the same time and season; this causes the low condition of cotton. *Davidson:* In the weeds, and will fall short. *Benton:* Prospect gloomy. *Haywood:* Owing to excessive rains during June, the cotton-crop became literally smothered with grass and weeds.

Missouri appears to be giving increased attention to the culture of cotton, and with encouraging results: Fourteen counties report making an average condition of 105; 7 being one hundred, 6 above, and 1, Pemiscot, 80. In the last named, the crop is "much more in the grass than in other years;" in Ozark, it "looks fine;" in Cedar, where the condition is put at 110, cotton is receiving the attention of growers, and "has thus far proved a profitable crop;" and in Stoddard, where the condition is also 110, the only drawback is that the lands "are at present too rich, for the cotton averages about four feet high, and therefore requires to be planted farther apart than in most of the cotton-lands; otherwise it does not mature well." The highest condition is in Dale, 130.

Kansas is also experimenting in cotton-growing with encouraging prospects. Montgomery reports considerable cotton planted this season. Labette: "Cotton first planted in the county promises well." Sumner: "Cotton doing superbly, but, as it is our first year of extensive experiments, we can hardly make an average condition." Eight counties report making an average condition of 105.

OATS.

The prospective yield of oats during June declined in all the New England and Middle States, Maryland, Virginia, Mississippi, Ohio, Michigan, Indiana, Illinois, Minnesota, Iowa, Missouri, Kansas, and Nebraska. The condition of the crop was enhanced in all the other States, especially in the South. That is, the prospects have declined in those States, which produced 227,993,000 bushels of the estimated total yield of 1872, which was 271,747,000. The drought prevail-

ing in the Eastern States is sufficient to account for the great decline in that quarter. Insect enemies and stormy weather are alleged as causes of same decline in the Northwestern States. The following table shows the status of the counties reported:

States.	OATS.			States.	OATS.		
	Counties above average.	Counties aver-age.	Counties below average.		Counties above average.	Counties aver-age.	Counties below average.
Maine	2	2	5	Texas	15	10	15
New Hampshire		3	5	Arkansas	16	7	3
Vermont			10	Tennessee	41	8	5
Massachusetts		2	6	West Virginia	17	5	7
Rhode Island			3	Kentucky	22	12	9
Connecticut	1		5	Ohio	2	13	42
New York	2	3	37	Michigan	7	4	25
New Jersey			13	Indiana	10	8	33
Pennsylvania		3	44	Illinois	14	23	29
Delaware	1		2	Wisconsin	19	7	5
Maryland	2	2	11	Minnesota	10	14	11
Virginia	40	23	9	Iowa	16	22	11
North Carolina	31	13	12	Missouri	28	18	20
South Carolina	9	3	3	Kansas	19	15	5
Georgia	34	17	5	Nebraska	7	5	5
Florida	8	1		California	1	5	12
Alabama	25	9	3	Oregon	11	4	
Mississippi	11	6	6				
Louisiana	4	3	1	Total	425	270	417

MASSACHUSETTS.—*Norfolk:* Oats having had an early start, are not so much affected by drought.

CONNECTICUT.—*Hartford:* Oats about two-thirds of a crop.

NEW YORK.—*Columbia:* Almost a failure. *Schoharie:* Not over a half crop. *Warren:* Unavoidably a short crop. *Wyoming:* Injured by drought. *Orange:* Poorest crop ever known. *Chautauqua:* Backward but looking well. *Rensselaer:* Many fields will not be harvested. *Schenectady:* Heading out 6 inches from the ground. *Westchester:* There will be no oats. *Albany:* Heading out 6 inches high; many fields will be pastured. *Chenango:* Suffered from drought. *Erie:* Thin.

NEW JERSEY.—*Sussex:* Injured by drought. *Morris:* Short and poor. *Camden:* Short and thin.

PENNSYLVANIA.—*Montgomery:* Oats poor; injured by drought. *Wayne:* A failure. *Westmoreland:* Injured by drought. *York:* Straw short but yield good. *Union:* Backward. *Bucks:* Very light; some pastured and some turned under and sown with Hungarian grass. *Clearfield:* Promising. *Centre:* Shortened by drought. *Dauphin:* Only a half crop. *Fayette:* Short strawed, but heading well. *Huntingdon:* Injured by cold weather in April and May. *Lycoming:* Injured by drought. *Lancaster:* Very poor; heading low. *Tioga:* Injured by drought. *Pike:* Average yield 40 bushels per acre. *Indiana:* May yet reach a reasonable crop.

DELAWARE.—*Kent:* Injured by drought.

MARYLAND.—*Washington:* Crop will be short. *Baltimore:* Injured by drought. *Queen Anne:* Very much revived by the late rains.

VIRGINIA.—*Pulaski:* Promising. *Fluvanna:* Unusually good. *Lunenburgh:* Oats promising. *Wythe:* Oats sown late and unpromising. *Warren:* Threatened by grasshoppers. *New Kent:* Fine in quality. *Orange:* Fine crop assured. *Caroline:* Season favorable. *King George:* Excellent. *Powhatan:* Good. *Sussex:* Better than for several years. *Clarke:* Injured by early drought, but greatly improved with late favorable weather, especially in the north part of the county. *Chesterfield:* Winter seeding yielded largely; spring seeding heavily headed; prospect of largest yield since the war. *Washington:* Heading low on account of drought. *Bath:* Look well. *Middlesex:* Winter oats excellent. *Nansemond:* Late and short. *Madison:* Unusually promising. *Gloucester:* Drought has cut short a very promising crop. *Sussex:* Better than for years. *Mecklenburgh:* Fair crop. *Henrico:* Very good. *Halifax:* Much improved since June 1; injured by chinch-bug. *Highland:* Doing well. *Prince George:* Best crop in many years. *Campbell:* Extraordinary promise.

NORTH CAROLINA.—*Forsyth:* Very fine. *Franklin:* Suffering through drought. *Da-*

vic: Never better. *Alamance* Fair crop. *Davidson:* In many localities winter-killed. *Polk:* Better than for several years. *Greene:* More or less injured. *Cherokee:* Promising; free from rust.

South Carolina.—*Lexington:* Potato-oats from the Department ripened three weeks later than the black oats, and, consequently, injured by the late rains; yet the potato-oats is superior, being a foot taller than the black.

Georgia.—*Schley:* Oats in fine condition. *Calhoun:* Large crop. *Douglass:* Finest crop for many years; potato-oats did very well. *Muscogee:* Below expectation. *Spalding:* Never looked better *Gwinnett:* Fine; full average. *Cobb:* Injured by wet. *Whitfield:* Entirely free from rust; never better.

Florida.—*Jackson:* Largest crop ever raised.

Alabama.—*Blount:* Oats-crop very fine. *Chambers:* Very fine. *Clarke:* Carter "rust-proof" oats very fine. *Geneva:* Good. *Bullock:* Unusually good.

Mississippi.—*Grenada:* Potato-oats from the Department very fine; sown about March 16. *Macon:* Fine. *Grainger:* Very fine; 30 bushels per acre. *Winston:* White oats mature too late, ten days after red oats. *La Fayette:* Unusually good. *Jefferson:* Very fine, but considerably fallen through wind and rain. *Wilkinson:* Injured by excessive rains.

Louisiana.—*Morehouse:* Potato-oats fine. *Caddo:* Average, eighty bushels per acre.

Tennessee.—*Wilson:* Unexceptionable. *Donelson:* Very good. *Monroe:* Best crop in many years, but badly lodged. *Bradley:* Promise an abundant yield. *Robertson:* A splendid crop ruined by rain and wind.

Texas.—*Gonzalez:* The "Mississippi red" oats do not rust. *Rusk:* Fine and large; did not rust. *Bandera:* Destroyed by grasshoppers. *Cooke:* Greatly improved by the rains. *Burnet:* Injured by grasshoppers. *Upshur:* Late rains saved the crop. *Polk:* Red or "rust-proof" oats a perfect success. *Kendall:* Entirely destroyed.

Arkansas.—*Fulton:* Increased acreage and splendid crop. *Independence:* Never better.

West Virginia.—*Raleigh:* Very good. *Pendleton:* Promising; acreage increased. *Braxton:* White Schonen oats a very promising crop; also the Black Norway. *Barbour:* Good. *Mercer:* Quite promising. *Cabell:* Late, but looking well. *Pocahontas:* Fine condition. *Monroe:* Over average.

Kentucky.—*Boyle:* White Schonen fine, but badly lodged. *Johnson:* Somewhat injured by rain. *Scott:* Very tall; will fall if wet weather continues. *Russell:* Very fine. *Pulaski:* Some fields rusted and some fallen on account of rain. *McLean:* Excelsior a successful crop, but rather late in maturing; more productive than native varieties. *Logan:* Superior. *Fayette:* Early-sown very good; late-sown very poor. *Laurel:* Promise a good yield. *Adair:* Better than usual.

Ohio.—*Hamilton:* Birlie oats a failure; potato oats not promising. *Allen:* Inferior in quantity and quality. *Athens:* Oats were promising, but late winds and rain have left them flat. *Hancock:* Look well. *Holmes:* Short but growing finely. *Portage:* Increased acreage; good color, but short-strawed; greatly improved by late rains. *Morrow:* But half the usual acreage sown; condition below average. *Delaware:* The fine weather will probably bring the crop to a full average. *Crawford:* Sown late and will be short. *Coshocton:* Wet April and May, and dry June, have cut down the yield one-half. *Morgan:* Backward. *Mercer:* Acreage reduced. *Marion:* Late sown; acreage reduced. *Lorain:* Crop late. *Adams:* Suffering for rain. *Medina:* Sown late and hurriedly. *Jackson:* Short-strawed, but stand well on the ground. *Greene:* Early-sown good, but the most were late-sown on account of wet, and are very poor. *Williams:* If rain does not come soon the crop will be a failure. *Noble:* Injured by drought.

Michigan.—*Washtenaw:* Crop short. *Tuscola:* Need rain. *Lenawee:* Shortened by drought. *Clinton:* Suffered severely from late drought. *Cass:* Injured by drought. *Van Buren:* Suffered from drought. *Ionia:* Suffered from drought. *Calhoun:* Injured by drought. *Branch:* Shortened 40 per cent. by drought.

Indiana.—*Brown:* Rain just in time to save a short crop. *Morgan:* Average condition; half average acreage. *Montgomery:* Light; short-strawed; heads medium. *Noble:* Will not amount to much. *Newton:* Short-strawed, but heads and grains well developed. *Martin:* Destroyed by drought. *Harrison:* Late, but look well. *Kosciusko:* Failure through drought. *Lake:* Shortened by drought, but benefited by late rains. *Owen:* Reduced acreage and short crop. *Orange:* Look well. *Ripley:* Made a good start, but are suffering from drought.

Illinois.—*Franklin:* Badly injured by late storms. *Ogle:* Acreage decreased; condition below average. *Montgomery:* Average restricted by spring rains. *Macon:* "Potato" oats ripen ten days later than "Surprise" oats. *Lawrence:* Decreased acreage; promising. *De Kalb:* Promising. *Marion:* Ruined by chinch-bugs. *Jersey:* Very good; stand up well and are well filled. *Iroquois:* Acreage restricted by bad sowing weather in spring. *Clark:* Small acreage sown. *Madison:* Acreage reduced one-half by bad spring weather at sowing. *Sangamon:* Very promising.

Wisconsin.—*Dunn:* Early-sown oats good.

MINNESOTA.—*Goodhue:* Spring-wheat promising. *Faribault:* Badly injured by wet, especially on low grounds. *Douglass:* Prospect never so good before. *Fillmore:* Looking first-rate. *Blue Earth:* Injured by wet.

IOWA.—*Plymouth:* Good on fall plowing, but not good on spring plowing. *Harrison:* Sown largely, and promising.

MISSOURI.—*Dallas:* Chinch-bugs mischievous. *Wright:* Finest crop for years; potato oats poor. *Phelps:* Chinch-bugs injured the crops. *Clay:* Look as well as they can. *St. François:* Fine, but damaged by storms. *Reynolds:* Fine, but much thrown down by winds. *Ralls:* Unusually promising. *Pulaski:* Increased acreage; looks well. *Jasper:* Threatened by chinch-bugs. *De Kalb:* Average. *Bolinger:* Fine. *Christian:* Very poor. *Caldwell:* Remarkably good; heading out June 26. *Chariton:* Late-sown; looks poorly. *Platte:* Hardly worth saving. *Rice:* Potato-worms. *Neosho:* Threatened with chinch-bugs. *Labelle:* Suffering from chinches: reduced one-fourth. *Davis:* Damaged by winds and rains on bottom lands.

NEBRASKA.—*Cass:* One-fourth of the oats blighted. *Nemaha:* Oats very productive and seldom fail. *Boone:* Suffering from drought. *Merrick:* Short.

DAKOTA.—*Hanson:* Look well.

COLORADO.—*Larimer:* Greatly damaged by grasshoppers.

NEW MEXICO.—*Mora:* Benefited by late copious rains.

RYE.

Winter-rye improved during June in Rhode Island, Connecticut, New Jersey, Maryland, Virginia, North Carolina, Mississippi, Texas, Arkansas, Ohio, Michigan, Illinois, and Iowa. It remained stationary in Georgia, and declined in all the other States reported. Spring-rye is average or above in Minnesota, Iowa, Missouri, Kansas, Nebraska, and Oregon. In all the other States it is below average; the minimum, 70, is in California, and the maximum, 110, is in Nebraska.

NEW JERSEY.—*Burlington:* Quality good.

PENNSYLVANIA.—*Montgomery:* Rye well grown and matured. *Fayette:* Very little grown, and only to tie up corn-fodder. *Tioga:* One farmer raised 24 bushels on a single acre, the average being 16 bushels.

MARYLAND.—*Baltimore:* Above average.

NEW YORK.—*Columbia:* No grain; very fair straw. *Saratoga:* Looked finely in the spring, but the heat burned it out.

VIRGINIA.—*Pittsylvania:* Rye raised only by a few old settlers; it will thrive on a soil less rich than that required by wheat. *Sussex:* Better than for several years. *Highland:* Greatly winter-killed.

NORTH CAROLINA.—*Clay:* Almost a failure. *Greene:* More or less injured.

TEXAS.—*Gonzales:* The common native rye has done well. *Medina:* Nearly destroyed by grasshoppers. *Bandera:* Destroyed by grasshoppers. *Burnet:* Injured by grasshoppers. *Blanco:* Acreage increased 50 per cent. *Kendall:* Entirely destroyed.

TENNESSEE.—*Donaldson:* Very good. *Bradley:* Very fine.

WEST VIRGINIA.—*Mercer:* Stood the freeze much better than wheat. *Pocahontas:* Good prospect.

KENTUCKY.—*Fayette:* Good. *Butler:* Badly frozen out.

OHIO.—*Greene:* Crop fine and safe.

INDIANA.—*Newton:* Winter-rye escaped the freeze, and now promises a full yield.

ILLINOIS.—*Barton:* Winter-rye from the Department looks splendid; other varieties badly frozen out.

KANSAS.—*Davis:* Winter-rye on uplands generally good. *Leavenworth:* Very good.

NEBRASKA.—*Nemaha:* Rye very productive. *Merrick:* Rye from the Department doing splendidly.

BARLEY.

Winter-barley during June improved in Pennsylvania, Georgia, Kentucky, Michigan, Missouri, and California; it declined in Texas, Ohio, and Kansas. Spring-barley improved in New Hampshire, Rhode Island, Ohio, Michigan, and Wisconsin; it declined in Maine, Vermont, Massachusetts, Connecticut, New York, Pennsylvania, Indiana, Illinois, Minnesota, Iowa, Missouri, Kansas, Nebraska, California, and Oregon.

GRASS AND PASTURES.

Owing to the drought, which prevailed in June throughout the New England and Middle States, and in portions of Ohio, Michigan, and California, pastures and clover are below average in all those States; and timothy in all, except Vermont, 101; Connecticut, 102; and Massachusetts, Rhode Island, and New York, 100. In all the other States pastures are above average, and clover is average or above in all except Mississippi, 95; Illinois, 92; Wisconsin, 83; and Minnesota, 88. Florida, Louisiana, and Texas do not report clover, and these States, together with South Carolina and Mississippi, do not report timothy, which is above average in all the remaining States. The States showing the highest condition of pasturage are Alabama, 118; Texas, 115; Wisconsin, 114; Mississippi, 113; Louisiana, 112; Georgia, 111; and Florida and Nebraska, 109; Arkansas and Tennessee, 108; Iowa and Missouri, 107; Kansas, 106. Those lowest are Rhode Island, New York, and Pennsylvania, 75; New Jersey, 78; Maryland, 79; Massachusetts and Connecticut, 80; California, 85; Vermont and Pennsylvania, 89. Of clover, the highest condition is found in Missouri and Nebraska, 107; Georgia and Oregon, 106; South Carolina, 105; Kansas, 104; the lowest in New Jersey, 70; New York, 72; Rhode Island, 78; Massachusetts, 79; Delaware, 80; Wisconsin, 83; the highest of timothy, in California, 110; Minnesota, 107; Wisconsin and Nebraska, 106; Georgia, Alabama, Tennessee, and Missouri, 105; the lowest, in New York, 67; Rhode Island, 72; Connecticut and New Jersey, 75; Massachusetts, 76; Vermont, 77; Maryland, 82; Delaware, 83; Maine, 84; Pennsylvania, 85.

Since the 1st of July, refreshing rains have revived those sections that were suffering from drought, and the hay-crop, though not reaching an average, will evidently be larger generally than correspondents then predicted. The following extracts will afford more specific information respecting the condition of pastures and grass, and the prospects of the hay-crop in the several States:

MAINE.—*Androscoggin:* Clover and timothy fair, as they got a good start before the pinching drought came on. Old fields and pastures are suffering. *Oxford:* Pastures drying up; unless rain comes soon cattle will have to be fed from the stable. *Franklin:* The dry weather the last half of June has injured the hay-crop materially. *Aroostook:* Grass wintered finely, and the hay-crop must be abundant, though the grass will not be fit to cut for two weeks yet. Pastures good and stock in thriving condition. *Sagadahoc:* One of the severest droughts ever known at this season; hay will consequently be light.

NEW HAMPSHIRE.—*Grafton:* Very little rain for some four weeks, and if the drought continues much longer it will affect the hay-crop seriously. *Carroll:* Suffering badly from drought. Hay-crop will be small. *Belknap:* Having a very dry time; grass is suffering. *Sullivan:* The lack of rain for the month of June is telling hard on the hay-crop. *Hillsborough:* Should have had an unusual crop of clover but for the drought; as it is, we have more than for several years. Clover and other grasses have suffered at least 25 per cent. We began to cut the 15th of June, and now the great proportion of English grass is in the barn in fine condition. *Merrimac:* The hardest drought for many years, so early in the season; grass on dry soils about ruined.

VERMONT.—*Windham:* The grass in many places is entirely dried up, and the prospect is that we shall not get more than half an average crop of hay. *Addison:* The season opened with great promise for grass, but for three weeks past we have suffered severely from drought, reducing the crop of clover and timothy 50 per cent. *Rutland:* Grass in pastures and meadows is fast drying up. *Orleans:* All crops suffering from drought; hay-crop very short and drying up; on light soils not half a crop. Clover in low lands much injured by frost May 31. Pastures are better than mow-lands. *Grand Isle:* Grass thick set in the spring. Only occasional light showers since the snow went off; consequently grass is drying up. *Franklin:* The comparatively cool weather has to some extent mitigated the severity of the drought, which has prevailed for a month and a half, upon grass; while many of our pastures are much parched, in

the main they seem to stand the drought better than the meadows, and the effect upon dairy products, our great specialties, is less felt than usual in dry seasons. *Caledonia:* The most severe drought for many years until June 25; since that date frequent rains, and the grass has improved in many places one-half. *Chittenden:* Not over three-fourths of an average crop of hay; pastures drying up very fast.

MASSACHUSETTS.—*Norfolk:* All kinds of grass are short; while on some low wet land a fair crop will be cut, upon old and dry meadows in many cases it is not worth cutting. *Dukes:* Pastures and hay-crop shortened one-half by the severe drought which has prevailed for some time. *Berkshire:* A month since we have had rain of any amount. Grass started most beautifully in May; now newly stocked lands and *top-dressed* meadows are in general medium—some more than that. The falling off will be on old meadows and very dry soils. The crop will probably be better than last year's. Farmers are each year giving up plowing more and more, and top-dressing with all the manure they can make. This saves much labor and pays well. *Worcester:* Very dry; pasturage short. *Franklin:* A severe drought prevailing through the county; the hay-crop will be short. Pastures drying up. *Hampden:* No rain for seven weeks; pastures drying up. *Plymouth:* June a very dry month; pastures suffering very much.

CONNECTICUT.—*Windham:* Never knew of such a drought at this season; many fields of grass are completely dried up.

NEW YORK.—*Saint Lawrence:* Emphatically a grazing county, wholly devoted to dairying. The pastures have been very fine, and a large yield of butter and cheese has been made. The hot dry weather for a few days past has shortened the pastures and dried up the meadows, but a larger yield than last year is expected. *Columbia:* Pastures light; a very severe drought is now affecting everything. *Westchester:* No rain for four weeks. Pastures are all dried up. *Rensselaer:* The worst drought I have seen in this county in sixty-five years. Shortest crop of hay for many years; on many fields and spots there will be no hay gathered. *Montgomery:* Scarcely any pasture, (owing to the severe drought.) Some farmers are feeding their milch cows on grass mowed from the meadows, and many are purchasing Western corn to feed their stock on next winter. *Greene:* Vegetation is completely dried up in our county. The pastures and some of the meadows are literally burned up. *Chemung:* We have had a half dozen light showers in the last week, too late to save our grass crop. Another winter with scarce and dear fodder is inevitable. *Steuben:* Old meadows are very light, caused by drought. *Warren:* Have had but little rain since April; grass is drying up fast. Hay is unavoidably a short crop, and clover and timothy sowed in the spring cannot be found at present. *Cattaraugus:* Hay-crop injured by spring frost and dry weather. *Albany:* The earliest and greatest drought that has ever prevailed in the county; the hay-crop very poor. Am urging our farmers to plow up old meadows, after mowing, and sow corn for fodder, and intend to do so myself. *Orange:* Hay very light; but little more than half an average crop. *Madison:* Very dry; hay not over half a crop. *Wyoming:* Clover and timothy are a short crop. *Washington:* Very dry; much of the corn planted this spring did not vegetate. *Kings:* Uncommonly dry season; hay-crop very light. Hay is selling to-day at $2 per hundred; ten days ago the same could be bought for $1.50. *Jefferson:* Dry weather during May and June; our meadows cannot be benefited much more, and hay, the crop we most depend upon, will be light. *Onondaga:* Not more than half a crop of hay. *Ontario:* June the dryest month ever known; old meadows the thinnest and poorest known. Good rains within a few days, and grass now doing well. *Allegany:* June dry until the last; pastures short, but now, July 5, the ground fully wet.

NEW JERSEY.—*Sussex:* The clover, timothy, and pastures are injured by the dry weather. The hay-crop will be light. *Mercer:* Timothy will almost be a failure in some parts of the county owing to the severe drought. *Union:* Clover nearly all killed last season by the early drought; timothy short, and on gravelly soil burned; only one light shower for over five weeks. *Burlington:* Hay-crop hurt by the drought; many fields will not cut half an average. Our farmers are sowing a great deal of millet and Hungarian grass. These did good service last year, and there will be an increased acreage this. *Warren:* Clover and timothy rather short, owing to some insect destroying the clover in some measure last summer. *Essex:* An extraordinary diminution in the rain-fall; the hay-crop will be very short, and the pastures are literally burning up.

PENNSYLVANIA.—*Montgomery:* Grass and pastures are moderately good, but want rain. Grass well set but short. *Lebanon:* Hay nearly all made and of a superior quality, but below an average in quantity. *Butler:* Clover and timothy not over a half crop; will not be half-crop of hay. *York:* Grass an average crop. *Wayne:* Very dry the past month; the hay-crop will be light. *Lancaster:* Farmers are now making hay, and with the good weather they have had they have housed the best and most solid crop of hay ever harvested. It grew up with very little wet weather, and consequently is of a very good quality. *Clearfield:* A fair crop of grass. *Lycoming:* Having a drought, which will make the timothy meadows somewhat short. *Lehigh:* The dry

spell in the middle of June retarded the growth of grass very much. *Fayette:* The hay-crop lighter than for many years. *Erie:* Clover not three-fourths of a crop. *Chester:* The early spring was wet and cold, making the ground in a condition to bake; the weather then setting in hot and very dry cut short the hay-crop and spoiled the pastures. *Dauphin:* The entire month of June has been excessively dry, and pastures are almost burned up. *Centre:* Hay-making is about finished; the crop was good. *Crawford:* A severe drought for some six weeks has shortened the hay-crop and the pastures very much. *Lawrence:* June very dry and hot, almost parching up the pastures and meadows, up to the 23d; then a heavy rain completely soaked the ground, but too late for most of the hay, which will not be much over half a crop. *Tioga:* The severe drought in June injured clover, timothy, and pastures. *Susquehanna:* Feed plenty. *Indiana:* The hay-crop will be light.

MARYLAND.—*Montgomery:* Most of the clover-fields failed of a set. *Dorchester:* The drought (which still prevails) has seriously shortened the clover and timothy. *Baltimore:* The hay-crop considerably injured by the protracted drought. *Howard:* Abundant early rains gave us good clover, and the subsequent drought has affected it but little. *Charles:* The drought of last year is being felt in the grass-crops.

VIRGINIA.—*Pulaski:* Grass promises well. *Northumberland:* Timothy and clover thin, owing to the effects of winter, but the growth good, as it was last year. On several farms the army-worm has appeared, and farmers are mowing the crop to save it. *Rappahannock:* The clover sown this season is well set, and promises well. *Stafford:* Condition of pastures better than last year. *Warren:* Pastures are parched by the dry weather. Clover, injured by frost in winter, is entirely destroyed by grass-hoppers in the northwestern part of the county. *Sussex:* Clover and timothy are rapidly superseding barn-straw. *Powhatan:* Pasturage good. *Caroline:* Pasturage never better. *Chesterfield:* Pasturage excellent from frequent rains. The first cutting of clover good, with a fine prospect for a better second crop. Timothy and grasses generally good. *Loudoun:* June dry; pasturage giving way, while clover and timothy have held their own pretty well. *Fairfax:* The hay-crop will not be a full one. Old timothy meadows have not recovered from the drought of the past two years. *Fauquier:* Grass promises a full crop. *Madison:* Pasturage good; clover good, but acreage far below average; timothy excellent. *Nansemond:* Clover late and short. *Prince George:* Clover and timothy, where not killed out by the drought last summer, have produced a heavy yield. *Henrico:* The cool, wet weather of April, May, and June was the very thing for grass, and Henrico was never more blessed in this respect. Clover, finer than I ever saw it, was cut and sold nearly a month ago, and the second crop is mostly fine. *Montgomery:* All crops late except grass; the season dry until July 1st. *Highland:* Pastures better than usual.

NORTH CAROLINA.—*Pitt:* The few small lots of red clover planted last spring have proved a decided success, and will stimulate its increased production. *Ashe:* Grass fine.

SOUTH CAROLINA.—*Greenville:* Clover is cut in June; second crop promises to be the best; timothy is as high as the wheat this year.

GEORGIA.—*Lumpkin:* One of my assistants sowed the Italian rye-grass, (sent by the Department,) and, if it continues as it now promises, he considers it the *best* pasture.

ALABAMA.—*Greene:* The crop of clover is small but exceedingly good. *Morgan:* Our clover crop (for hay) nearly lost by wet weather. *Randolph:* But little clover sown.

MISSISSIPPI.—*Wilkinson:* Red clover, timothy, Italian rye-grass, mesquite, orchard, and other grasses were very fine, but have been much damaged by excessive rains. The clover-crop cut off one-half in value from having no weather in which to harvest it.

LOUISIANA.—*Franklin:* Pastures could not be better.

ARKANSAS.—*Independence:* Pasturage never better. *Arkansas:* Grass never looked better. *Fulton:* In the last year or two several of our farmers have sowed clover for an experiment, and it promises to do well.

TENNESSEE.—*Coffee:* Rain all the time since the middle of June, which will injure the hay-crop very much if it continues two weeks longer. *Giles:* Out of the past twenty-two days it has rained nineteen, and is raining still; the meadows need mowing. *Loudon:* Grasses have not suffered. *Stewart:* All the grasses have done well. *Giles:* Much of the clover was killed by the winter freezes. Pastures that were almost bare on the 1st of May are now luxuriant. *Jackson:* Grass-crops very fine. *Montgomery:* Where not frozen out clover looks well. *Bedford:* Clover suffered during the winter by the hard freezes, and owing to the late spring pastures are not equal to last season. *Bradley:* On account of the dry April, clover was reduced to less than half a crop. *Knox:* The month of June has been one of almost constant rains, which have made the clover and timothy much better. *Lincoln:* In the midst of an unusually wet spell, the hay crop is now ready, and in a few instances suffering for want of cutting. *Granger:* A cold snap about the 6th of March killed about one-half of our clover and timothy. *Monroe:* Pastures generally improving: clover good where it was not killed by frost and cut-worms in the spring. Timothy and red-top splendid. *Wilson:* Clover not so good as last year; much of it blighted by the freeze of winter.

Pasturage good. Timothy and all meadow-grass look well. *Weakley:* Clover and timothy very good. *Fentress:* Grass extra good.

WEST VIRGINIA.—*Jefferson:* About 225 acres of Hungarian grass has been sown for hay, to make up in some measure for the scarcity of the regular crop of clover and timothy. *Pocahontas:* Season never better for grass. Clover, fine prospect; timothy, very heavy crop. *Cabell:* Both clover and timothy good. *Harrison:* A magnificent crop of grass; meadows will be better than for several years. *Wayne:* Hay nearly all secured in good condition; doubt whether we ever had a more abundant crop. *Barbour:* The finest grass for many years. *Pendleton:* Pastures and meadows more than double in quantity and quality. *Raleigh:* Pastures very good. *Monongalia:* Rains during the past week fine on the pastures; meadows backward, and will not produce more than two-thirds of a crop.

KENTUCKY.—*Laurel:* Meadows promising a good yield. *Fayette:* Clover was badly winter-killed. Pastures not as good as usual. *Anderson:* Pastures very fine, and the meadows better than common and much clearer of weeds. *Hardin:* Pastures very poor; clover all frozen out. *Larue:* Clover killed in the winter. *Lincoln:* Pastures very good. *Livingston:* Have had so much rain that it has destroyed nearly everything except grass. *Logan:* All clover one year old and over frozen out in February and March.

OHIO.—*Meigs:* Clover very badly winter-killed; the dry weather of last fall killed much of the timothy meadows. *Trumbull:* Very dry time; hence grass very light. *Miami:* Grass-crop very fine. *Ross:* The clover-crop is grand. *Fulton:* Extremely dry; meadows and pastures drying up. *Genesee:* Pastures and meadows very fine. *Jackson:* Meadows better than for many years. *Medina:* Pastures had turned brown, and meadows were at a standstill, but now they are checked in their downward course. *Adams:* No rain since June 3d; grass suffering. *Erie:* Very dry; grass light. *Lorain:* Clover short in growth, but mostly secured in good order. Pastures over an average. *Pickaway:* Seasonable rains have made fine grass and hay. *Vinton:* Grass promises well. *Crawford:* Pastures good; good crop of clover. *Athens:* Grass abundant in pastures and meadows.

MICHIGAN.—*Wayne:* Meadows unusually poor, owing to the severity of last winter and to a very severe drought in June. *Hillsdale:* Pastures and timothy injured by drought. *Shiawassee:* Pastures much improved by a heavy rain on the 28th and 29th of June. *Livingston:* Pastures all drying up; old meadows nearly killed out. *Montcalm:* Clover and timothy very poor, owing to the cold last winter; never saw timothy so poor in this county. *Kalamazoo:* A scorching drought of four weeks, commencing the 28th of May, had begun to tell fearfully on the pastures; a fair rain on the 29th of June revived everything.

INDIANA.—*Scott:* Grass of all kinds splendid. *Ripley:* Clover and timothy made a good start, and clover is made, but timothy will be injured materially if rain does not come soon. *Orange:* Timothy seems hurt by winter; meadows foul. *Dubois:* Some fields of grass injured by the worm; otherwise it is extra fine. *Floyd:* Meadows not first rate, and pastures about an average. *Hamilton:* Clover and timothy a fine crop. *Harrison:* Pastures and meadows splendid. *Switzerland:* Hay-crop not quite as good as last year.

ILLINOIS.—*Sangamon:* Clover and timothy, where recently seeded down, suffered very much for want of rain in June. *Pike:* Clover very heavy. Pastures excellent; timothy very light. *Tazewell:* Grass-crop will be good but late. *Warren:* Season very dry; grass-crop very light; pastures nearly bare for want of moisture. *Edgar:* Our people now begin to appreciate clover; have increased the acreage fully 200 per cent., and it is very fine. *Edwards:* The meadows would have been excellent had not the army-worm swept through. *Lee:* Hay will be an average crop; many have cut down their grass, and it now lies bleaching in the field. *Perry:* Timothy-meadows much injured by the army-worm. *Mercer:* Most of the clover killed. *Franklin:* Very much of the timothy destroyed by the army-worm; what they did not injure, very excellent. *Douglas:* Wet; much hay already spoiled.

WISCONSIN.—*Brown:* Red clover greatly winter-killed; timothy partly winter-killed, but the wet weather has made it up to a full average. *Ozaukee:* Old meadows below an average, but new do first rate, and clover, especially where plaster has been applied, was never better. *Pierce:* Clover never so badly winter-killed; yet some fields sown last season, that were well covered with clover-straw, very splendid. *Portage:* Grass heavy. *Richland:* Clover winter-killed some in the south part of the county. *Walworth:* The winter so injured the clover that one-fourth of a crop is all we can realize. *Waukesha:* Clover winter-killed. *Jefferson:* Clover completely winter-killed; upland meadows of all kinds suffered by the hard winter. *Dane:* Clover of more than one year badly killed; timothy and the native grasses have had a luxurious growth. *Eau Clair:* Grass ready for cutting soon as the weather will permit. *Green:* Clover badly winter-killed. *Outagamie:* Not twenty-four hours without rain for the past two weeks; clover, which is generally cut the last week in June, suffering badly.

MINNESOTA.—*Dakota:* Grass of all kinds is very heavy. *Houston:* Grass seldom better. *Goodhue:* Red clover severely damaged by successive freezings.

IOWA.—*Lyons:* The hay-crop will be below average; nine-tenths of the clover in pasture and meadow killed last winter. *Louisa:* Clover was nearly all frozen out. *Des Moines:* Clover about all winter-killed; timothy will make about half a crop. *Lee:* Many timothy-meadows badly damaged last year by grub-worm, which, with little rain for a month, will make the yield short. *Monona:* Clover reduced by the severe winter.

MISSOURI.—*Platte:* A great deal of rain in June; clover has been injured. *Cass:* Pastures extra. *Bollinger:* Clover and timothy good. *Boone:* All timothy-meadows very much injured by the white-blossom weed. *De Kalb:* Clover and timothy very heavy. *Harrison:* Grass fine and strong. *Manteau:* Timothy badly frozen out. *Ozark:* Clover, timothy, and pastures look fine. *Phelps:* Abundant showers, and the pastures, clover, and timothy are looking finely. Hay is being cut. *Barry:* Continuous showery weather through May and June brought the grasses forward rapidly. *Schuyler:* Grass in all its conditions very fine.

KANSAS.—*Douglas:* Hay is excellent. *Leavenworth:* Grasses never were better. *Butler:* Pasturage excellent. *Osage:* Clover and timothy the finest I ever saw.

CALIFORNIA.—*San Luis:* Drought and grasshoppers have made sad havoc with our pastures. *Tuolumne:* The early cessation of the winter rains has caused the pastures to dry up nearly two months earlier than usual. *Humboldt:* Pastures are looking extra fine.

OREGON.—*Multnomah:* The season throughout the entire Willamette Valley favorable for grass. *Douglas:* On account of our dry summers, timothy as a meadow lasts but a short time. Most farmers depend on raising wheat and oats, and cutting green for hay. *Columbia:* Timothy looking exceedingly well. *Polk:* More rain in June than usual, grass-crop presenting a fine appearance.

FRUITS.

In the northern sections of the country, the intense cold of last winter, and in the southern, late severe frosts and freezes in the spring, did immense injury to the fruit-trees and grape-vines, and, only in a less degree, to the strawberry-vines. Vast numbers of peach-trees and many apple-trees were killed outright, (as will be seen from the subjoined extracts,) and very many more were seriously injured. The injury to apple-trees was more serious and extensive than was apparent when the report for May and June was made up. Many trees that leaved out and bloomed profusely have since died; and where apples appeared to be well set the complaint is general that they wither and drop off. Insects are doing more or less injury to the portions of the crop which are otherwise in fair condition. In Kansas an "apple-tree blight" prevails somewhat extensively. It is described as closely resembling the "pear-tree blight."

Apples are below average in condition in every State except Oregon, (where but few are produced,) which is 101. The States in which the condition is lowest are Tennessee, 36; North Carolina and Illinois, 50; Delaware, 53; Connecticut, 55; Kentucky, 56; Massachusetts, 58; South Carolina, 60; Rhode Island and Wisconsin, 66; Indiana, 69; New Jersey and Texas, 70; Pennsylvania, 71; Iowa and Missouri, 73; Maine, Maryland, Georgia, and Minnesota, 75; New York and Ohio, 76; New Hampshire, West Virginia, and Kansas, 77.

Peaches are below average in condition in all the States producing them; the lowest is in Ohio, 26; Tennessee, 33; Pennsylvania, 35; Kansas, 36; Illinois, 42; South Carolina, 44; Michigan, 45; Connecticut and Missouri, 48; North Carolina, 54; West Virginia and Kentucky, 56; New Jersey and Maryland, 58; Massachusetts and Nebraska, 61; Indiana, 63; Texas, 66. The highest condition is in Rhode Island, 98; and the next in Oregon, 95.

Pears, the condition of which is not reported by figures, promise relatively better than apples and peaches.

Grapes.—The average condition of grapes in Nebraska is represented

by 106; Delaware, 103; West Virginia, 100; in all the other States it is below 100. North Carolina, 60; Pennsylvania and Ohio, 62; Illinois, 63; California, 70; Indiana, 72. The remainder range between 77, (Tennessee,) and 98, (Oregon.)

Strawberries.—The average condition of strawberries was, in Nebraska, 127; Delaware, 125; Oregon, 113; Kansas, 106; Maryland and Alabama, 104; Mississippi, 101; Arkansas and Minnesota, 100. In the remaining States the range was from 61 in New Jersey to 96 in California.

MAINE.—*Androscoggin:* Apples did not blossom largely, and almost all blighted. Grapes have put out well. *Oxford:* Apples looking well: in many places caterpillars abundant. *Aroostook:* Apples, plums, and cherries never looked more promising.

VERMONT.—*Grand Isle:* Small fruits good, but apples and pears begin to fall.

MASSACHUSETTS.—*Norfolk:* Apples very few and more than commonly affected by insect bites. Peaches in many cases winter-killed, and but little fruit. Grapes winter-killed in some cases.

NEW YORK.—*Niagara:* One per cent. of an average crop is a high estimate for the peach-crop. *Rensselaer:* Apples and pears dropping off. *Steuben:* Grapes are setting very full. Apples do not promise a full crop. *Cattaraugus:* Fruit injured while in blossom by frosts. *Wyoming:* Apples not promising; crop will be short. Grapes looking well. Strawberries have done well. *Erie:* The crop of apples, pears, and cherries is large.

NEW JERSEY.—*Sussex:* Apples not plentiful, and peaches and grapes very scarce. Most of the trees and vines suffered severely last winter, many being killed down to the ground. The strawberry-crop ruined by the drought. *Mercer:* Fruit will be about a failure in some parts of the county owing to the severe drought. *Burlington:* Peaches reported 50 in part of the county; none at all in this section. Poor crop of cherries. *Morris:* Apples set quite full; are falling off considerably. Think the wood was injured last winter by freezing. No peaches of any consequence on low land; fair crop on high land, but falling off very much. A good crop of pears.

PENNSYLVANIA.—*Wyoming:* Peach-trees nearly all killed last winter and grapes mostly frozen down to the ground. *Snyder:* The peach-trees and grape-vines have all been frozen. *Butler:* Apples reduced to one-fourth of a crop by the effects of the dry weather. Peaches nearly all winter-killed. *York:* Fruit of all kinds will be enough to satisfy all reasonable demands, except peaches, which are a failure. *Lancaster:* Fruit-crop very short, without exception, and peaches a total failure. *Clearfield:* Apples a great show of blossoms, but the fruit rather light. *Washington:* No peaches worth mentioning. *Lehigh:* No peaches except a few on elevations of about 900 feet above tide-water: in lower localities no blossoms appeared; grapes shared the same fate, except those laid down and protected. *Fayette:* The peach-buds were nearly all killed, and in many instances the trees badly injured by the severe cold of last winter; grape-crop light from the same cause. *Erie:* Peaches and grapes killed by the hard winter. *Beaver:* But few peach-trees survived last winter's freezing. *Cameron:* Grapes will not be more than half a crop; bugs are destroying them. *Luzerne:* Fruit scarce. *Indiana:* But little fruit of any kind: apples are falling off. *Jefferson:* Peaches all killed by frost.

MARYLAND.—*Dorchester:* The acreage in strawberries is seven times what it was last year, but the fruit not over double, on account of the dry weather. Peaches are falling off the trees badly, and what promised a full crop last month may not yield over half a crop. Grapes are extremely promising where intelligently cultivated. This section appears to be peculiarly adapted to them. *Kent:* No cherries in the county.

VIRGINIA.—*Spottsylvania:* Very many apples have fallen from the trees. The peach-crop is extra large; grapes very fine. *Sussex:* A great falling off in apples and peaches, owing probably to two or three severe frosts in May last. Small fruits are attracting more attention than heretofore. *Orange:* Grape-culture promises to become within a few years a leading industry of the county. *Chesterfield:* Very small percentage of apples clinging to the trees. A very heavy crop of cherries and plums. Peaches very fine and with prospect of paying well. *Princess Anne:* The fruit-crop, especially peaches, bids fair to be larger than ever known in the county. Apples will be short. *Greenville:* Apples blossomed and set very full, but the cold, wet weather caused them to fall off so that now very many trees are without any. Peaches about in the same condition. *Floyd:* The fruit-crop not so promising now as last month. Apples very defective; at least one-fourth of the entire crop are falling off prematurely. *Fairfax:* Peaches have generally failed. *Fauquier:* Grapes promise a heavy crop. *Southampton:* Apples in good condition, but the crop very small. A fine and large crop of peaches. *Alexandria:*

Peach-crop very poor from severe cold and heavy sleet in February and March. *Highland:* Peaches a failure.

NORTH CAROLINA,—*New Hanover:* Fruit-crop almost entirely destroyed by heavy frost in April. *Chatham:* So much rain that grapes have rotted badly. Over one-third of my pear-trees are dead or dying with the blight. *Chowan:* Not enough apples to make vinegar for the county's use. Pears, peaches, and grapes will fall short of an average crop. *Franklin:* The fruit-crop is very uneven; the hail damaged it in some sections of the county. *Iredell:* An entire failure in apples and peaches on account of late frosts. *Davidson:* The late frost killed both apple and peach blooms in many places. *Alamance:* Fruit-crop very short—almost a failure. This county, in 1872, shipped 400,000 pounds of dried fruit—berries, cherries, plums, peaches, and apples. The shipment in 1873 will be very small. *Moore:* The late frost destroyed the apple and peach crop except in very elevated localities. *Robeson:* The only year within my recollection that the fruit of all kinds was so entirely destroyed by frost. *Clay;* The apple and peach-crop almost a failure. *Madison:* Apples were nearly all killed by the late frosts, and the fruit-crop generally is almost a failure. *Stokes:* Apples and peaches continue to drop off. *Stanley:* The frost of April swept away the apples and peaches. *Burke:* By reason of late frosts, the apple and peach crops are an entire failure in some parts of the county.

SOUTH CAROLINA.—*Clarendon:* Fruit of every kind seriously injured by late frosts: not a half crop on the trees. *Lexington:* Grapes generally destroyed by the frost. Only once before, in the last thirty years, do I remember such a calamity to have befallen us.

GEORGIA.—*Richmond:* Varieties of grapes of the types *Estivalis, Cordifolia,* and *Labrusca* are decaying badly, except Ives, Delaware, and Concord. The latter are not quite sound, but better than most other varieties. Scuppernong and all varieties of the type *Rotundifolia* are sound, but the crop of fruit small, owing to the superabundance of rain during the inflorescence of the vine. Crop of peaches small; injured by frost April 26. A very large crop of pears. *Baldwin:* Apples and peaches were injured by late frosts. *Gwinnett:* All fruits killed by late frosts, except in a few localities.

FLORIDA.—*Orange:* The orange-crop promises to be a good one. *Jackson:* Peaches are about the same as last year. Grapes are doing well.

ALABAMA.—*Jefferson:* The increase in the culture of the grape, particularly the Scuppernong, is great in this county, and the increase of wine from the same will be at least 300 per cent. this year. *Montgomery:* Early apples and peaches ripe, very good, and the crop more abundant than last year. Grapes promising and abundant; also strawberries and blackberries. *Winston:* Fruit not as abundant as common, but larger, and therefore quite equal to an average crop. *Calhoun:* Apples and peaches have rotted and fallen off badly. Grapes have been pierced by an insect, and are rotting. *Bullock:* Apples and peaches were injured by the late frosts.

MISSISSIPPI.—*Newton:* Peaches were plenty, but have rotted. *Amite:* Peach-crop nearly destroyed by a series of late frosts; apples not injured. *Grenada:* The fruit crops all better than last year. *Lee:* Fruit crops as promising as ever seen. Peaches and apples ripe; grapes, both cultivated and wild, are very abundant, but all the tame varieties are more or less rotting from the constant rains. *Smith:* Very late frosts and heavy hail destroyed the apples and peaches to a considerable extent. *Tishomingo:* Not many peaches; grapes are rotting. *Wilkinson:* Peaches, grapes, and other fruits much injured by excessive rains.

LOUISIANA.—*Franklin:* Apples very fine and plentiful; peaches, supply scant; prospect good. *Morehouse:* The peach-crop very small; apples fine; grape-vines heavily laden with fruit; never have seen the like either in France or in Germany.

TEXAS.—*Dallas:* Peaches an entire failure from frost the 25th of March. *Blanco:* Apples, pears, peaches, cherries, figs, plums, almonds, and wild grapes, all destroyed by late frost and grasshoppers. *San Saba:* All fruit entirely destroyed by late frost and grasshoppers. *Upshur:* Very late and much injured by rains in June. *Gonzales:* Fruit killed by late frosts; peaches nearly all destroyed; but few apples growing. *Medina:* Peach-crop damaged by the grasshoppers. *Colorado:* The frost killed the peaches. *De Witt:* Peach-trees are bending with fruit of fine size. Grapes fine. *Ellis:* The frosts killed all our fruit. *Hays:* Peaches and grapes all killed by frosts and freeze last spring. *Karnes:* Fruit crop very much injured by the late frosts. Grapes were nearly all destroyed except the variety known as the the Black Spanish, which was not much affected by the frost. There is an abundant crop of the native wild-grape, (known as the Mustang,) from which excellent domestic wine is manufactured.

ARKANSAS.—*Franklin:* The apple-crop bids fair to be a very large one. No peaches except on very elevated situations.

TENNESSEE.—*Williamson:* The apple-crop is a failure. *Stewart:* Fruit nearly all killed by late frosts. *Lawrence:* Peach-crop greatly damaged by late spring frosts. *Giles:* Apples and peaches a failure, except on high points and points protected by timber, from the frost of April 26. *Meigs:* The late frosts killed almost all the fruit. *Smith:* Frost the 26th of April killed nearly all our fruit; the little left is in

poor condition. *Bedford:* Apples and peaches a failure, except in a few localities on the hills. *Bradley:* All fruit generally cut off by a frost April 25. *Grainger:* Fruit is a failure, but on the high "knobs" we have some apples and peaches. *Sevier:* Have never before seen so complete a failure of fruit. *Dickinson:* The late frost killed nearly all the apples, peaches, pears, and plums, and greatly damaged all the smaller fruit. *Humphrey:* Fruit almost a failure. *Morgan:* The heavy frost in April blighted the fruit. *Fentress:* No apples or peaches to speak of; small fruit good.

West Virginia.—*Monroe:* Rose-bug rather troublesome on fruit-trees. *Mercer:* Apples, peaches, &c., were badly destroyed by frosts. *Pleasants:* The leaves of apple-trees are turning yellow, and the fruit dropping off. *Barbour:* Peach-crop an entire failure. *Raleigh:* Light crop of apples; very few peaches. *Boone:* Peaches winter-killed; apples look well.

Kentucky.—*Daveiss:* A severe freeze, late in May, did much damage to fruit in many localities; killed nearly all the grapes, but the vines put out again with a prospect of one-fourth of a crop. *Adair:* Fruit killed by frost. *Jefferson:* The only failing fruits are pears and strawberries. *Laurel:* Apples nearly all killed by late frosts; no peaches. *Butler:* Apples a total failure; peaches almost a failure. *Fayette:* Fruit generally a fair crop. *Hardin:* Apples and peaches almost an entire failure. *Taylor:* Fruit crop a failure. *Logan:* The late April frost destroyed all fruits except on a few high hills. *Owsley:* Not half a crop of apples and scarcely any peaches.

Ohio.—*Meigs:* Apples and peaches dropping off badly. *Noble:* A fair crop of apples if nothing happens. *Ross:* Peaches a failure. *Franklin:* Fruits, both tree and small, suffered by the extreme cold of last winter. *Lorain:* Grapes, winter killed. *Marion:* Grapes largely killed by the winter. *Vinton:* Owing to the frosts in April and May no fruit except grapes and a few apples. *Coshocton:* Peach-crop a total failure. *Crawford:* Peaches all killed; great bulk of grape-vines killed and crop almost nothing. *Ottawa:* Only a few scattering peaches. *Holmes:* Peaches all winter-killed; grapes and pears promise an abundant crop. *Hancock:* So large a crop of apples never known here before; they have to be knocked off in order to save the trees. *Athens:* The apple-crop almost a failure; no peaches. *Allen:* A large proportion of the grapes killed by the very cold winter.

Michigan.—*Van Buren:* The severe winter nearly destroyed peaches and grapes; apples falling off. *Cass:* A pinching drought in June made havoc of the apple and strawberry crop. *Clinton:* Apple-trees badly damaged by the severe winter; many killed; apple-crop small. *Hillsdale:* Apples fair; peaches winter-killed. *Manistee:* Very few peaches; grapes look well; strawberries plenty. *Shiawassee:* But few apples; peach-trees mostly killed by the severe winter. *Tuscola:* A limited supply of fruit; no peaches. *Washtenaw:* Many peach-trees killed by the hard winter. *Benzie:* The severe winter killed many of the peach-trees. *Lapeer:* The winter killed a large part of the peach-trees, and damaged grapes. *Livingston:* Apples all drying up on the trees. *Monroe:* The exceedingly cold winter killed nearly all the peach-trees, and injured a good many grape-vines. *Newaygo:* Many trees that blossomed full have dropped *all* their fruit, and most of the others have but a light crop. *Antrim:* The curculio is stinging our plums.

Indiana.—*Ripley:* No apples; no peaches, and the grape-vines were badly damaged in the winter; strawberries, also, damaged very much. *Shelby:* Apples falling off continually; have not heard of a peach in the county; at least 50 per cent. of the trees killed by the winter. *Dubois:* Peach-crop very short and falling off the trees. *Kosciusko:* Peach-trees nearly all winter-killed. *Floyd:* Peaches very plenteous in some localities, and in some none. *Hamilton:* Peaches all killed, and the trees a good deal injured; a large per cent. of the grape-vines were killed. *Newton:* The unprecedented winter did considerable damage to fruit-trees and grape-vines. *Pike:* Peaches in good condition, but the quantity not more than 20 per cent. *Franklin:* Apples dropped off badly; not many left; no peach-blossoms; trees injured by winter; general failure in fruits. *Howard:* Fruit a partial failure. *Morgan:* Apples amount to but little; peaches to nothing; grape-vines nearly all winter-killed.

Illinois.—*Morgan:* Fruit nearly an entire failure. *Bureau:* Apples average in condition, but not over one-fourth of a crop in quantity; a tenth of the trees killed or badly injured by the winter. *Macisson:* Summer apples a full average; winter apples not half a crop. No peaches. *Sangamon:* Fruit crop very light; grapes mostly frozen to the ground, but making fine growth for next year. *Champaign:* Peach-trees nearly all killed; apple and pear trees badly injured. *Clark:* The apple, pear, cherry, and plum crop nearly all blasted. Peach-trees badly winter-killed. *Jersey:* Peaches and small fruits a failure; apples and pears knotty and wormy; Concord grape-vines heavy bunches; other kinds a failure. *Washington:* Apples more than half stung by the curculio; falling off. Peaches *all* killed by the hard winter; trees nearly all killed. *Winnebago:* Canker-worm destroying nearly one-third of the orchards in this vicinity. *Whiteside:* Indications are that the apple-worm will bring the crop down to one-fourth. Strawberries pretty much winter-killed. *Carroll:* The past winter very destructive to fruit-trees. *Clinton:* Eight-tenths of the peach-trees dead, and one-tenth of the apple-trees

dead or dying from the effects of last winter. *De Witt:* Apples average in condition, but lamentably deficient in quantity; also grapes, *Effingham:* Apples have dropped off; no peaches; over one-half of the trees winter-killed. *Fulton:* No peaches; apples almost an entire failure. *Hancock:* Peach-trees and some apple-trees badly injured by the winter; tender kinds of grapes killed. *Knox:* The apple-crop a total failure; many trees dying from the effects of the winter. *Lawrence:* The apples have nearly all fallen off. No peaches; trees nearly all killed. *Macon:* Grapes few—the Catawba the only kind that has any. *Moultrie:* Apples a failure. *Putnam:* Apple-trees very much injured by the winter; many dead, and more will die. *Tazewell:* Peach-trees mostly killed by the winter, and apple-trees badly injured; many will die. *Vermilion:* Bearing peach-trees nearly all winter-killed, and apple and cherry-trees considerably injured. *Warren:* Last winter injured fruit-trees of all kinds, killing many apple, pear, plum, and sweet-cherry trees. All tender varieties of grape-vines, with a part of the Concords, suffered to some extent. In orchards of 500 trees, not an apple to be found, though the bloom was fuller than usual. *White:* Apples and peaches dropping off badly. *Boone:* Apples not affected by canker-worms doing well, but many orchards are being denuded. *Edwards:* The tent-caterpillar has riddled many orchards, and a terrible hail-storm completed the destruction. No peaches. *Massac:* Apples and peaches somewhat injured by the cold last spring. *Ogle:* Most of the apples have fallen off. Some of the fruit-trees, and the tender varieties of grape-vines, were killed or injured last winter. Raspberries that were mulched are doing well. *Mercer:* The heavy bloom of fruit-trees will result in but a small crop. *Franklin:* Apples dropping off very much. Peaches nearly a total failure. The winter caused much damage to the grape-vines.

Wisconsin.—*Clark:* Apples, grapes, and strawberries injured by cold winter and hard frosts in May. *Washington:* Five per cent. of the apple and pear trees dying; the trees blossomed out beautifully; three weeks after, they looked in a sickly condition, and now the leaves and fruit are drying up. *Brown:* The bloom of apples was very profuse, but a cold night during the blooming season seems to have destroyed much of the fruit. *Richland:* Apple-orchards winter-killed; look very bad; grape-vines badly winter-killed. *Walworth:* Fruit comparatively a failure. *Dodge:* The frost in May nearly destroyed all the apples, pears, and strawberries; will not be more than one-tenth of a crop. *Vernon:* Apples a failure; the bloom deceptive, and over half the trees dead or injured. *Calumet:* Peach-trees nearly all killed, and other fruit-trees and grape-vines injured very much, last winter.

Minnesota.—*Mower:* Fifty per cent. of the apple-trees and grape-vines were killed. *Douglas:* The last winter injured young orchards and killed some entirely, leaving only the crab species uninjured. *Isanti:* The extreme cold of the winter did immense damage to our young orchards. *Olmsted:* The severe winter destroyed many kinds of standard-fruit trees, supposed to be quite hardy, and a large amount of small fruit. *Ramsey:* The winter killed a large portion of the apples, pears, peaches, and plums. *Goodhue:* Apple-trees, with few exceptions, very much injured by successive freezings; many bearing-trees ruined; grapes have suffered from the same cause.

Iowa.—*Clarke:* The yield of fruit promises to be extraordinary. *Lyons:* From 5 to 10 per cent. of the bearing apple-trees killed last winter; most of the trees that are now dead blossomed and threw out leaves; peach-trees all killed; 50 per cent. of the plum-trees; 10 per cent. of the grape-vines. *Guthrie:* Grapes winter-killed, more than I ever knew them; even Concords, both old and young, killed to the ground; apples bloomed wonderfully, but the hard winter destroyed a great many. *Harrison:* Apples succeeded well, and are planted in large amount each year. *Delaware:* Fruit generally fair considering the damage done last winter. *Floyd:* Apples almost a failure; many trees killed. *Hardin:* About 20 per cent. of the fruit-trees and grape-vines killed by the winter. *Louisa:* Last winter greatly injured the fruit-trees; old trees suffered the most. *Marshall:* About 15 per cent. of large bearing apple-trees died after blooming. *Taylor:* Peaches almost played out; quite a number of trees killed, and others badly injured. *Des Moines:* Bearing peach-trees killed last winter; apple-trees badly damaged; next to no crop. *Monona:* Apples and grapes reduced by the severe winter. *Muscatine:* All kinds of fruit manifesting the bad effects of last winter. *Jasper:* Past winter very severe on fruit-trees and grape-vines; 50 per cent. of the apple-trees and grape-vines killed, and more of the pear-trees. *Tama:* Grape-vines injured by winter; many two-year-old Concords killed; pear-trees and many apple-trees dead, and others injured.

Missouri.—*Gasconade:* Peaches on the low land were nearly all killed last winter. *Platte:* The apple-bloom was very heavy, but most of the young apples are fallen off; not more than a fourth of a crop. Many of the trees dying; the decay commences on the south side of the tree. *Cass:* Peaches an entire failure. *Caldwell:* Peach-trees and grape-vines badly frozen and killed on low ground. *Barton:* Fruit of all kind a total failure on account of the cold last winter. *Cole:* Apples below average in quantity; no peaches; grapes doing well, the Concords and similar varieties promising a full yield. *Taney:* Almost all peach-trees killed. *Adair:* All the old peach-trees

killed; the young trees doing well, but no fruit. *Bollinger:* Apples and peaches good but scarce; most of the peach-crop killed by the freeze. Grapes good, though there is some rot, owing to an insect, I think. *De Kalb:* Peaches killed last winter. *Holt:* The largest bloom of apples is resulting in the poorest crop ever known; a blight in the twigs or ends of the limbs, and insects or worms in the young fruit. Unless we do something to encourage birds our fruits will fail; we have very few birds, and no law to protect them. *Laurence:* Peach-crop all killed, and apples damaged greatly. *Lincoln:* Apples are falling and have been all the season. *Moniteau:* Peach-trees, to a large extent, killed; no fruit. Catawba grape-vines killed; other kinds injured, but will make a partial crop. *Pulaski:* Peaches totally winter-killed; nearly all the old trees killed: the young trees uninjured. Grape-vines growing vigorously, but not so much fruit as last year. *Saint Clair:* The blight very extensive this year, particularly in young orchards. *Worth:* Peaches a failure; all killed in the winter. *Clay:* Peaches an entire failure, and apples and other fruit nearly so. Grapes injured by the freeze, the Concords alone sustaining the estimate for the crop. *Howard:* Peach-trees all killed, except those one or two years old. Grape-vines, except Concords, all killed to the ground. *Jefferson:* Peaches an entire failure; many orchards killed, and have been cut down. Pears blighted and nearly a failure. The blight has just struck the vineyards, and the crop is much injured. *Phelps:* Peaches all killed; apples only three-fourths of a crop and some wormy. Grapes rotting from warm, wet weather. *Dade:* No peaches. *Callaway:* Peach-trees nearly all killed, and other fruit-trees and grape-vines injured very much.

Kansas.—*Shawnee:* A species of blight has attacked the apple-trees in the western part of this county, killing to the ground whole orchards of bearing-trees. *Douglas:* A terrible blight has again appeared among our apple-orchards, killing very many trees from fifteen down to three years old in nurseries. The blight acts precisely like the pear-blight. *Wyandotte:* Peach-crop an entire failure; probably one-half an apple-crop. When in bloom the trees were injured by some insect—many branches being killed, and in some instances the trees—resembling the blight in pear-trees. *Coffey:* Apples and peaches which promised a full half crop in May have cast the fruit until there will be but little more than one-fourth crop. *Morris:* In May a furious hail-storm (some of the stones weighing three ounces) injured fruit very badly. *Nemaha:* A blight on the peach-trees—"*curled leaf*"—is damaging all the orchards in the county. Apple-trees have done badly; much of the fruit falling off the last two weeks. *Woodson:* The apple-crop will be very light, owing to a severe storm that seemed to blast them in the bloom. *Linn:* Grapes not winter-killed are looking well. Clintons not injured by winter, and Concords not much; but rose-bugs are eating them up. *Labette:* Not any apples or peaches; killed by the frost. *Logan:* Apples in condition are equal to last year, but in quantity only one-fourth. *Miami:* Young trees doing uncommonly well; have never seen such growth. *Osage:* Peaches all destroyed by winter freeze. *Ripley:* Apples and peaches very scarce; a great many old peach-trees killed. *Washington:* Peach-trees were not killed in this county last winter, and there are peaches wherever there are trees old enough.

Nebraska.—*Merrick:* A fearful snow-storm in the middle of April ruined a great many fruit-trees.

California.—*Sonoma:* The fruit and grape crops will be better than was expected. *Butte:* First grape-blossoms were cut down; second blossoms, nearly as good as the first, put forth and promise well as such. *Sacramento:* Fruit-crop injured by late severe frosts; on same localities the peach-trees and crop are injured from the effects of mildew of the foliage. *San Luis:* May frosts destroyed half of our fruit, but that left appears to be of superior quality. *Mendocino:* Our fruit-crop is short, owing to late frosts, except grapes, which promise a large yield. *Tuolumne:* The heavy frosts in April and May injured fruit of all kinds; apricots and walnuts were almost entirely cut off; cherries, strawberries, and peaches, about one-half. *San Bernardino:* The peaches and grapes have been affected by late frosts. *Klamath:* The grapes were seriously injured by frost.

Oregon.—*Lane:* Fruit in general looks much better than last year. *Clackamas:* Apples and peaches rather below average on account of late frosts. Strawberries, cherries, cherry-currants, and the Lawton blackberry do well in this county. *Clatsop:* Small fruits, both cultivated and wild, abound. *Douglas:* The peach-crop was injured by the late frost.

Utah.—*Utah:* The cold rains and frosts in May and the beginning of June killed the early peaches. *Iron:* Frost, June 6, killed apple, pear, and peach blooms. Strawberries blighted badly. Heavy crop of English gooseberries, and red Dutch currants. *Washington:* Fruit-crop short owing to late frosts.

POTATOES.

An increased acreage in potatoes is noted in Vermont, Connecticut, Virginia, South Carolina, Georgia, Florida, Alabama, Arkansas, Tennessee, Kentucky, Wisconsin, Missouri, Kansas, Nebraska, and Oregon. The acreage remains the same as last year in Massachusetts, Rhode Island, New York, North Carolina, Mississippi, Indiana, and Minnesota. The remaining States showed a decreased acreage. The maximum acreage is found in Nebraska, 121; and the minimum in Delaware, 86. The potato-bug extended its ravages in the Eastern States, while in many points in the West its injuries were quite severe. Fear of this insect in many cases induced the cultivation of smaller crops. A condition above average is reported in Georgia, Florida, Alabama, Mississippi, Arkansas, Tennessee, and Missouri. In Wisconsin the condition was full average, and in all the other States below. The maximum, 111, is found in Georgia; the minimum, 76, in Delaware.

NEW HAMPSHIRE.—*Cheshire:* Early potatoes suffering from drought. *Carroll:* Will be a good crop if the rain comes.

MASSACHUSETTS.—*Dukes:* Suffering very much from drought. *Norfolk:* Late-planted crops backward. *Plymouth:* Early-planted crops have suffered severely.

NEW YORK.—*Wyoming:* Potatoes looking well; Colorado bug has just appeared. *Chautauqua:* Potato-bugs injurious. *Kings:* Crop not so good as last year.

NEW JERSEY.—*Morris:* Shortened by drought, but improved by late rains. *Burlington:* Somewhat injured on high lands; look well on heavy lands.

PENNSYLVANIA.—*Montgomery:* Early potatoes shortened by drought. *Huntington:* Colorado bugs at work; early plantings injured and later ones threatened. *Fayette:* Seriously injured by Colorado bugs. *Elk:* Late Rose, as well as all other varieties, attacked by the bug. *Beaver:* Colorado bug very injurious. *Snyder:* Colorado bug at work. *Cambria:* Colorado beetle on hand as soon as the crop was up. *Butler:* Considerably injured by bugs. *Pike:* Average yield 150 bushels per acre. *McKean:* Bugs. *Forest:* Bugs bad; many save their crops by destroying them. *Crawford:* Bugs for the first time. *Jefferson:* Greatly injured by bugs.

MARYLAND.—*Dorchester:* Early potatoes injured by drought.

VIRGINIA.—*Warwick:* Yield and price good. *Chesterfield:* Large yield of small tubers. *Princess Anne:* Potatoes sold in Norfolk at $6 per barrel. *Nansemond:* Early crop not promising; later plantings better. *Northampton:* Potato-culture successful.

DELAWARE.—*Kent:* Late plantings delayed by drought.

NORTH CAROLINA.—*Moore:* Seriously damaged by drought.

SOUTH CAROLINA.—*Greenville:* Peruvian potatoes ran to tops and took a second growth.

ALABAMA.—*Montgomery:* Unusually fine. *Winston:* Benefited by rain. *Marshall:* Never better. *Bullock:* Full average and better than usual.

MISSISSIPPI.—*Tishemingo:* Remarkably fine.

TEXAS.—*Gonzales:* Nearly destroyed by frost. *Fayette:* Almost a failure by late frosts. *De Witt:* Marketed in May. *Austin:* Early Rose has done well.

TENNESSEE.—*Morgan:* Injured by wet.

WEST VIRGINIA.—*Raleigh:* Fine. *Kanawha:* Seriously injured by bugs; where the bugs have been destroyed crops are good; sprinkled lime a good preventive. *Doddridge:* Cut short by potato-bugs in some localities. *Cabell:* Early potatoes seriously injured by the Colorado beetle. *Marion:* Some crops not properly attended to have been swept by the Colorado beetle. *Pocahontas:* Fair condition.

KENTUCKY.—*Anderson:* Crop promising.

OHIO.—*Portage:* Increased acreage. *Morrow:* Crop reduced one-half by Colorado bugs. *Franklin:* Reduced 20 per cent. by Colorado bugs. *Trumbull:* The whole crop threatened by Colorado bugs. *Meigs:* Potato-planting reduced by fear of bugs.

MICHIGAN.—*Antrim:* Plenty of bugs, but farmers have the inside track. *Monroe:* Potato-bugs less numerous than last year. *Lapeer:* Potato-bugs very destructive; Paris green and other remedies successful where used. *Benzie:* Potato-bugs very few. *Tuscola:* Fewer potato-bugs. *Shiawassee:* Potato-bugs less annoying than formerly. *Mason:* Bugs plenty and active. *Manistee:* Potato-bugs require constant efforts for their destruction. *Hillsdale:* Bugs less numerous than last year. *Ionia:* Shortened by drought. *Calhoun:* Shortened by drought. *Branch:* Crops look well; bugs abundant.

INDIANA.—*Howard:* Doing well; lady-bugs killing off the potato-beetles. *Franklin:* Look well; fewer bugs than formerly. *Martin:* Colorado bugs numerous. *Marshall:*

Damaged by bugs. *La Porte:* Colorado bugs lively. *Harrison:* Look well. *Orange:* Bugs more successfully resisted than formerly. *Ripley:* Early potatoes ruined by drought. *Scott:* Fine; no bugs to hurt. *Ogle:* Suffering from bugs. *Massac:* Crops declining through drought and bugs for two years.

ILLINOIS.—*Stephenson:* Bugs less troublesome than formerly. *Montgomery:* Early potatoes a larger crop than for years. *Lake:* Bugs very destructive. *Winnebago:* Bugs numerous. *Sangamon:* Badly need rain. *Madison:* Bugs not numerous; picked from the vines. *Bureau:* Bugs determined to have the crop.

WISCONSIN.—*Juneau:* Bugs persistent and destructive. *Clarke:* Bugs troublesome. *Columbia:* Bugs numerous and destructive. *Milwaukee:* Late planted but fine. *Portage:* Looking well in spite of the bugs. *Ozaukee:* Bugs lively but easily destroyed. *Brown:* Abundant, but the rains help the vines to grow well in spite of them.

MINNESOTA.—*Renville:* Bugs less numerous. *Isanti:* Growing well, but the bug is destructive; Paris green a very effective remedy. *Wright:* Nearly all destroyed by the bugs. *Nicollet:* Affected by continual wet weather.

IOWA.—*Lee:* Late potatoes promise a fine crop. *Harrison:* Production decreasing on account of low prices.

MISSOURI.—*Phelps:* Look finely. *Ozark:* Look fine. *Bollinger:* Early-planted good. *Cass:* Extra.

KANSAS.—*Bourbon:* Seriously injured by chinch-bugs. *Butler:* Late potatoes suffering.

NEBRASKA.—*Jefferson:* Extra good. *Dixon:* Bugs early and plenty.

CALIFORNIA.—*Sacramento:* Shortened by drought and frost; in some localities completely ruined.

OREGON.—*Columbia:* A severe frost, June 23, killed potato-vines. *Clackamas:* Injured by late rains.

DAKOTA.—*Clay:* Bugs in some localities. *Sioux Falls:* Look well in spite of potato-bugs.

WASHINGTON.—*King:* Season unfavorable for potatoes.

SWEET-POTATOES.

An increased acreage in sweet-potatoes is reported in Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, West Virginia, Michigan, Iowa, and Kansas; in South Carolina the acreage remains the same as last year, and shows a decrease in all the other States, no crops being reported in New England, New York, Wisconsin, and Minnesota. The condition of the crop was full average or above in Georgia, Alabama, Florida, Mississippi, Texas, Arkansas, and Tennessee; it was below average in all the other States. The maximum, 108, was in Florida; the minimum, 76, was in New Jersey.

FLORIDA.—*Jackson:* Sweet-potatoes fine; late growing rains.

VIRGINIA.—*Pittsylvania:* Late planted, and show but little results as yet.

ALABAMA.—*Montgomery:* Promising. *Geneva:* Good.

NEW JERSEY.—*Burlington:* Plants badly killed by hot weather after setting out.

TEXAS.—*De Witt:* Increased area planted. *Karnes:* Promising.

IOWA.—*Harrison:* Culture increasing.

SUGAR-CANE.

An increased acreage was planted in Georgia, Florida, Alabama, and Mississippi, and a decreased acreage in Texas and Louisiana. The increase in Alabama amounted to 15 per cent. The crop was above average in Georgia, Alabama, and Mississippi, and below average in the other States. The growth of sugar-cane is reported in 75 counties, of which 1 was in South Carolina, 19 in Georgia, 10 in Alabama, 7 in Mississippi, 10 in Louisiana, and 16 in Texas.

ALABAMA.—*Geneva:* Crop never better. *Bullock:* Increased acreage planted; crop better than usual, promising a large quantity of fine sirup and sugar.

FLORIDA.—*Hillsborough:* Some crops a complete failure; their deficiency of yield made good by increased acreage.

MISSISSIPPI.—Louisiana sugar-cane largely grown here; 15,000 gallons of molasses made last year in this locality, besides a considerable quantity of sugar.

LOUISIANA.—Plant cane very good. *Lafourche:* Plant cane a good stand but behindhand. *Rapides:* Stubble cane killed again and but little seed planted; the latter very good. *St. Mary:* Sugar-cane has resisted the rain better than the corn.

SORGHUM.

Few of our correspondents make any notes upon sorghum, and those who do generally concur in representing that the cultivation of it is on the decline. The only exception noticed is in Texas, where, in De Witt County, "the sorghum-crop is increasing and is really a profitable crop." In West Virginia, Doddridge County, it "has been a failure for the last year or two on account of rust; very little planted this year;" in Jefferson County it "has pretty much gone out of cultivation." In Osage County, Kansas, it has "nearly gone out of use;" in Washington County, Ohio, it is "nearly abandoned;" in Washington County, Illinois, "the cultivation of sorghum is almost entirely suspended;" and in Renville County, Minnesota, "that crop will be a failure." In the twenty-three States which report its acreage and condition by figures, the acreage is less than last year, in all except Texas, (in which it is 9 per cent. greater,) the range being between 63 in North Carolina and 96 in Arkansas and Nebraska. In Virginia, in which the average is 13 per cent. less than last year, the condition is 6 per cent. above average. In Wisconsin, in which the acreage is 88, the condition is 102; in Georgia the acreage is 79 and the condition is 100. In the other States reporting, the condition ranges from 82 in Maryland to 98 in Arkansas. In North Carolina, Texas, and Tennessee, it is 97.

BEANS.

In Massachusetts, Rhode Island, Delaware, Mississippi, and Michigan, the acreage in beans is reported the same as last year. The States in which it is increased are Maine, New York, Maryland, Alabama, West Virginia, and Ohio, 102; Connecticut and Texas, 101; Georgia, 103; Florida, 113; Arkansas and Oregon, 105; Minnesota, 107; Kansas, 111; Nebraska, 109. In the remaining States the range is between 90 in Vermont and 99 in South Carolina and Wisconsin. In condition, Rhode Island and Michigan are average; South Carolina, 102; Georgia, 105; Florida, 118; Alabama, 107; Mississippi, Tennessee, and Oregon, 106; Arkansas, 103. The condition in the remaining States ranges between 80 in Delaware and 99 in North Carolina and Wisconsin.

TOBACCO.

An increased acreage was planted in Virginia, Texas, West Virginia, Kentucky, Indiana, Missouri, Kansas, and Nebraska. Arkansas and Tennessee return the same acreage as last year, while a decrease is reported in New Hampshire, Massachusetts, Connecticut, New York, Pennsylvania, Maryland, North Carolina, Georgia, Alabama, Ohio, and Illinois. The crop was full average or above in Alabama, Arkansas, Indiana, Illinois, Missouri, and Kansas. In all the other States reported it was below average. The maximum, 102, was in Alabama; the minimum, 76, in Massachusetts.

CONNECTICUT.—*New Haven:* Impossible to make the plants live.

VIRGINIA.—*Spottsylvania:* Crop increasing. *King William:* Low prices of grain have stimulated tobacco culture. *Bedford:* Tobacco culture retarded by rains. *Fluvanna:* Tobacco-plants plenty and planting season good. *Lunenburg:* Acreage full average, but late planting, &c., will bring the condition below average. *Prince Edward:* Planting delayed; increased acreage. *Orange:* Good stand. *Caroline:* Season favorable. *Powhatan:* Good. *Pittsylvania:* Culture increasing. *Sussex:* Improved condition due to free use of fertilizers. *Mecklenburg:* Starting well. *Halifax:* Poor stand; injured by drought; decreased acreage. *Essex:* Failed to secure a stand.

NORTH CAROLINA.—*Parsons:* Very bad condition.

MARYLAND.—*Howard:* Planting delayed by rain. *Calvert:* Severely injured by drought; but one-sixth of a crop standing.

TENNESSEE.—*Stewart:* Good time to set plants. *Truesdale:* Not in first-rate condition; too wet for cultivation. *Robertson:* Bad condition.

KENTUCKY.—*Logan:* Culture increased on account of the establishment of a large warehouse. *Henry:* Too late planted for a good crop. *Carroll:* Late planted. *Adair:* Increased acreage; promising. *Daveiss:* Unprecedented acreage planted.

INDIANA.—*Brown:* Acreage increased 10 to 15 per cent.; fine planting season.

WISCONSIN.—*Dane:* Low prices have restricted the cultivation of tobacco. *Walworth:* Growers discouraged by frosts and low prices.

MISSOURI.—*Ozark:* Looks fine. *Cedar:* Tobacco-growing greatly on the increase: we produce an article equal to Virginia's best. *Holt:* Largely increased acreage. *Chariton:* Early planted looks well.

OREGON.—*Clackamas:* Rather cool.

WOOL.

The wool-clip was full average or above in Maine, Vermont, New Jersey, Delaware, South Carolina, Georgia, Florida, West Virginia, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, California, and Oregon; it was below average in all the other States. The maximum, 127, was found in Oregon, the minimum, 92, in Tennessee.

NORTH CAROLINA.—*Iredell:* Average clip. *Floyd:* Wool interest falling off; too many dogs.

GEORGIA.—*Wilkinson:* Wool-raising a failure on account of worthless dogs.

TEXAS.—*De Witt:* Wool production increasing.

KENTUCKY.—*Carroll:* Fall of prices has induced farmers to hold over for a better market.

OHIO.—*Washington:* Held above present offers. *Medina:* Wool-clips lighter than usual, but the increased number of sheep will bring the aggregate clip to a full average.

INDIANA.—*Owen:* Clip short; sheep sold close last fall.

ILLINOIS.—*Boone:* Clip less than last year.

WISCONSIN.—*Walworth:* Clip full average and fully up to last year, despite declining prices.

MISSOURI.—*Phelps:* Clip short.

CALIFORNIA.—Clip short in staple. *Mendocino:* Clip largely increasing. *Amador:* Wool-clip increasing; flocks larger.

Table showing the condition of the crops, &c., on the 1st day of July, 1873.

States.	CORN.		WHEAT.		RYE.		OATS.	BARLEY.		PASTURE.	CLOVER.	TIMOTHY.	POTATOES (Solanum tuberosum.)		POTATOES, (Batatas edulis.) SWEET.	
	Average compared with last year.	Average condition July 1.	Average condition of winter-wheat July 1.	Average condition of spring-wheat July 1.	Average condition of winter-rye July 1.	Average condition of spring-rye July 1.	Average condition July 1.	Average condition of winter-barley July 1.	Average condition of spring-barley July 1.	Average condition July 1.	Average condition July 1.	Average condition July 1.	Acreage compared with last year.	Average condition July 1.	Acreage compared with last year.	Average condition July 1.
Maine	98	97	.....	.....	96	90	82	.....	87	91	90	84	98	94	.....	.....
New Hampshire	95	92	97	95	95	95	91	91	91	92	97	90	96	88	.....	.....
Vermont	94	76	90	88	87	94	81	.....	82	89	84	77	101	91	.....	.....
Massachusetts	92	91	100	96	97	90	79	81	77	80	79	76	100	86	.....	.....
Rhode Island	88	88	.....	.....	100	100	88	.....	95	75	78	72	100	83	.....	.....
Connecticut	99	87	97	.....	100	.....	80	.....	83	80	88	75	102	88	.....	.....
New York	95	76	82	80	92	79	69	72	74	75	72	67	100	84	.....	.....
New Jersey	95	88	98	.....	103	.....	68	.....	.....	78	70	75	95	78	85	76
Pennsylvania	96	80	99	84	98	92	76	92	85	89	87	85	98	84	93	88
Delaware	95	88	101	.....	85	.....	83	.....	.....	75	88	83	86	76	80	88
Maryland	97	84	98	.....	103	.....	82	.....	.....	79	80	82	95	80	94	87
Virginia	99	96	89	.....	93	.....	106	.....	.....	102	100	104	102	101	92	99
North Carolina	96	92	83	80	96	93	106	.....	.....	103	102	105	100	97	98	97
South Carolina	92	84	77	.....	92	.....	119	.....	.....	103	105	.....	102	95	100	98
Georgia	97	103	85	.....	95	.....	116	95	.....	111	106	105	103	114	102	106
Florida	105	106	.....	.....	.....	.....	121	.....	.....	109	.....	.....	109	106	110	108
Alabama	102	93	83	.....	91	.....	114	104	.....	118	101	105	106	110	106	102
Mississippi	101	96	100	.....	108	.....	101	.....	.....	113	95	.....	100	109	101	105
Louisiana	107	85	.....	.....	.....	.....	107	.....	.....	112	.....	.....	107	95	103	96
Texas	108	90	88	.....	92	.....	99	98	.....	115	.....	.....	99	86	107	103
Arkansas	105	101	103	.....	102	.....	107	.....	.....	108	101	102	106	105	96	100
Tennessee	99	99	77	78	92	95	112	100	.....	107	101	105	106	102	99	101
West Virginia	100	96	90	.....	93	.....	104	.....	.....	104	102	103	97	94	102	96
Kentucky	97	92	88	.....	88	.....	105	82	.....	103	94	101	101	99	98	95
Ohio	94	86	100	85	101	92	83	91	90	98	97	93	93	90	99	94
Michigan	98	90	86	92	100	98	83	93	84	93	92	87	98	96	107	98
Indiana	95	90	91	78	94	87	83	90	71	105	103	104	100	98	95	95
Illinois	88	85	76	100	92	92	91	93	95	100	92	92	99	94	98	98
Wisconsin	103	96	79	111	90	99	110	101	103	114	83	106	101	100	.....	.....
Minnesota	100	90	101	95	100	101	98	89	93	105	98	107	100	92	.....	.....
Iowa	101	89	82	103	101	103	93	85	95	107	100	104	97	97	107	95
Missouri	101	98	103	100	100	100	100	94	100	107	107	105	102	102	99	97
Kansas	115	93	107	105	105	.....	105	96	100	106	104	102	110	98	103	97
Nebraska	111	90	85	107	103	110	102	.....	97	109	107	106	121	98	91	96
California	92	88	89	80	90	70	86	88	88	85	96	98	98	93	94	96
Oregon	98	97	109	113	109	100	109	112	109	120	106	110	107	105	.....	.....

Table showing the condition of the crops, &c.—Continued.

States.	BEANS.		SORGHUM.		SUGAR-CANE, (not sorghum.)		TOBACCO.		COTTON.	WOOL.	APPLES.	PEACHES.	GRAPES.	STRAWBERRIES.
	Acreage compared with last year.	Average condition July 1.	Acreage compared with last year.	Average condition July 1.	Acreage compared with last year.	Average condition July 1.	Acreage compared with last year.	Average condition July 1.	Average condition July 1.	Amount of wool, *in hundredths*, compared with last year.	Average condition July 1.	Average condition July 1.	Average condition July 1.	Product compared with last year.
Maine	102	92								103	75		96	82
New Hampshire	98	95					95	85		97	77	67	91	80
Vermont	90	84								101	86		73	80
Massachusetts	100	91					95	76		96	58	61	92	74
Rhode Island	100	100								95	66	98	103	75
Connecticut	101	93					93	81		99	55	48	94	85
New York	102	86					95	85		98	76	70	91	77
New Jersey	93	83								102	70	58	90	61
Pennsylvania	97	93					97	81		97	71	35	62	85
Delaware	100	80	87	90						100	53	88	103	135
Maryland	102	75	76	82			79	79		99	75	58	81	104
Virginia	95	98	87	106			101	96	108	98	84	83	99	98
North Carolina	98	99	89	97			93	94	91	93	50	51	84	77
South Carolina	99	102	63	96					82	100	60	44	60	75
Georgia	103	105	79	100	104	106	95	97	94	100	75	77	90	94
Florida	113	118			102	99			99	104		78	98	
Alabama	102	107	77	94	115	106	91	102	85	96	80	76	88	104
Mississippi	100	106	90	95	103	104			83	99	95	88	95	101
Louisiana					89	89			80	95	93	68	97	80
Texas	101	95	109	97	95	95	104	88	78	93	70	66	85	90
Arkansas	105	103	96	98			100	101	106	97	97	82	79	100
Tennessee	110	106	91	97			100	97	96	92	36	33	77	73
West Virginia	102	101	90	93			103	93		101	77	56	100	88
Kentucky	97	98	89	90			103	93		99	56	56	93	72
Ohio	102	96	84	89			88	88		100	76	26	62	83
Michigan	100	100	86	88						101	90	45	85	79
Indiana	96	95	85	91			106	101		101	69	63	72	82
Illinois		92	82	90			99	100		101	50	42	63	61
Wisconsin	99	99	88	102			74	91		101	66		75	77
Minnesota	107	92	94	85						105	75		88	100
Iowa	97	95	88	92						100	73		80	90
Missouri	94	96	87	96			110	100	102	102	73	48	79	84
Kansas	111	98	95	96			105	100		109	77	36	92	106
Nebraska	109	91	96	93			102	95		110	97	61	106	127
California	97	90								110	85	81	70	96
Oregon	103	106								127	101	95	98	113

ENTOMOLOGICAL RECORD.

By Townend Glover, Entomologist.

Insects injuring corn.—In the month of June Mr. J. S. Nixon, of Chambersburg, Pennsylvania, sent to the Department of Agriculture specimens of what he calls "a new enemy to the agriculturist," in the form of a small beetle, which on examination proved to be the *Systena blanda* of Melsheimer. This insect is about 0.12 of an inch in length, and of a light creamy clay-color, having three longitudinal darker stripes on the wing-covers. These insects vary very much in color. Mr. Nixon writes that the beetles have nearly devastated a field of corn, eating the leaves and leaving the bare stalks standing. They hop like a flea, and when disturbed hide themselves in the soil, if they have not time to escape by flying away. They are very active and voracious, and being found in great numbers, they are very destructive to the corn-plant. They have not attacked anything but the corn (maize) so far.

Fig. 1.

These small beetles have not hitherto been reported as injurious to any of our crops, and as they are nearly related to the cucumber or flea beetles, the same remedies used for them will apply to the *Systena blanda*.

The Colorado potato-beetle.—The much-dreaded Colorado beetle, *Doryphora decem-lineata*, has made its appearance in Maryland, specimens having been received from Mr. Onderdonk, president of the College of Saint James, Washington County, where they were injuring potatoes materially by devouring the foliage. Larvæ were also received from G. S. Dressler, Oriental post-office, Juniata County, Pennsylvania; so it appears that this destructive insect is making its way east, and next year we may expect to hear more of its ravages in Pennsylvania and Maryland.

The grape-vine-root louse.—The roots of the grape-vines, both foreign and native, in the gardens of the Department of Agriculture, have been examined carefully for the *Phylloxera vastatrix*, or grape-vine *root* gall-louse, especially where the vines appeared sickly and weak, and although the grape-vine *leaf* gall-louse, *Pemphygus vitifatiæ* of Fitch, had been extremely plentiful on two of the vines (Muscat-Hamburg and Black Prince) in the grape-house, indeed so much so as to necessitate cutting them down, yet neither on these vines nor on any others near them could a true *root*-louse (*Phylloxera*) or any other insect be found, either in the autumn, winter, or spring. A deep trench was also cut between a long row of grape-vines planted for experimental purposes, and the roots being exposed, were carefully examined, yet none of the destructive root-inhabiting species could be found, proving conclusively that this destructive insect has not made its appearance in our experimental grounds.

Trap-door spider.—The Department of Agriculture has received from Mr. M. B. Wever, of Johnson's Depot, Edgefield County, South Carolina, through Mr. Charles R. Dodge, a very remarkable specimen of the nest and spider of the so-called trap-door spider. Some doubts having been expressed as to the locality of this spider, Mr. Wever writes:

I found the spider about the 1st of February (!) on an elevated piece of ground near my house, six miles east of Edgefield village, the county-seat of Edgefield County, on the head-waters of Turkey Creek, on my farm, twenty-five miles north of Augusta, Georgia, near Johnson's Depot, Charlotte, Columbia, and Augusta Railroad. I took the spider from the ground only a short time before it was shipped. It feeds only at night. A few years ago I had a mate to this. The hole was built under the pillar of my house. In visiting the nest at night I have found the spider absent on two or three occasions, but always at home during the day.

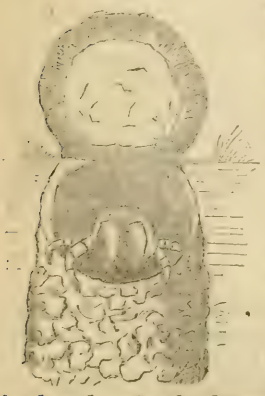
The spider sent by Mr. Wever so closely resembles, in form of nest, habits, &c., the *Cteniza nidulans*, or trap-door spider of the West Indies, described by Mr. Gosse in his Sojourn in Jamaica, that we doubted its having come from South Carolina, until we received Mr. Wever's interesting letter, and we shall therefore make some extracts from Mr. Gosse's account of its natural history, &c.

The spider first digs a cylindrical burrow with its jointed fangs and mandibles, from four to ten inches in depth and about an inch in diameter; the bottom is rounded, and the top, which is level with the surface of the earth, is closed by a circular lid, continuous with the tube for about a third of its circumference. This part may be called the hinge. The mouth of the tube is commonly dilated a little, so as to form a slightly-curved rim or lip; and the lid is sometimes a little convex internally, so as to fall more accurately into the mouth and close it.

Our specimen agrees in every respect excepting that the lid or trap-door is nearly circular, but with part of the circumference cut off, so as to form the hinge to the lid. The lid itself is composed of fragments of earth, spun together with a light gossamer web, and appears to be thicker where it forms the hinge to the trap-door. The spider itself never makes its appearance during the day, but must hunt for its prey at night, as several flesh-flies, put in the glass globe in which the nest is placed, invariably disappear before morning. When the lid is disturbed, the spider holds it down by means of its claws, and it is with the greatest difficulty that it can be opened, the animal exerting its whole strength, to prevent its being accomplished; but when this is effected it retreats to the bottom, whence it may be partially drawn up by placing a twig in the burrow, which the spider savagely seizes with its jaws, and may then be partially dragged into daylight. A piece of string, inserted one day under the trap-door to facilitate opening it when required, was removed by the spider and cast outside.

We have only been able to give an imperfect sketch of the nest and spider, as the animal could only be seen for a very short time, when momentarily dragged into view, as it almost instantaneously retreated to the bottom of its burrow as soon as brought into daylight, and we were afraid of killing it outright, if it had to be forcibly dragged from its burrow. From what was seen it appeared to be of a dark-brown color and somewhat hairy.

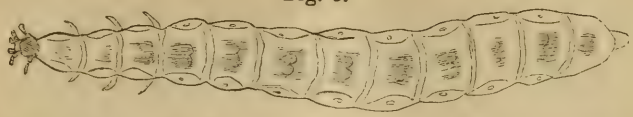
Fig. 2.



LUMINOUS LARVA.—Mr. Wever at the same time sent a large larva of a cream-color, shaded with chestnut on the back, that was very luminous, and showed a bright phosphoresent light in the rings of the body and spiracles. This light was of a pale bluish color, and so bright that it could be plainly seen in daylight, by putting it in a dark corner, or shading it with the hand. As the larvæ of *Melanactes*, a species of *Elater* or "snapping-

bug," are said to be luminous, it is possible that our larva belongs to the *Elateridæ*. It was found in wood-earth, but died soon after it was received.

Fig. 3.



INSECT INJURIES.—Our statistical correspondence shows a very serious development of noxious insects during the month of June in various parts of the country. It is very desirable that the self-sacrificing gentlemen who are so faithful in securing for the Department the latest and most reliable reports of the growing crops, could be induced to give special attention to the farmer's insect enemies in their respective neighborhoods, and furnish more specific data in order that the different species may be identified and the extent of their mischievous influence estimated. In several cases new insects have been noticed, either under names of merely local significance, or by description too imperfect for identification. In these cases it would be well to forward specimens to the Department, even in the case of long known insects. This course would be desirable, as it would enable the entomologist to recognise the exact character of the insect depredators in different parts of the country, and to suggest remedies for their devastations.

Grasshoppers, (*Caloptenus*, sp.)—The foregoing remarks find especial application in regard to the reports of grasshoppers. There are reasons for supposing that two species, *C. spretus* and *C. femur-rubrum*, are represented in our reports. It would be impossible for any but a careful entomologist to distinguish them, and hence the propriety of sending specimens.

Only four counties east of the Mississippi notice the presence of these insects. In some localities of Carroll, New Hampshire, they are very numerous, and unless checked by rain it was feared they would do great damage to the growing crops. In Warren, Virginia, they had destroyed some of the pastures, and were making demonstrations upon oats and barley. In Jefferson, West Virginia, they appeared in great numbers; so thick, in some places, that it was possible to take them up by the shovelful. They are also reported as "thick" in Edwards County, Illinois.

West of the Mississippi their mischievous influence was felt from Texas to Minnesota, and westward to the Pacific coast. Texas had an especially severe visitation. In Medina and Bandera Counties they nearly destroyed the grain-crops, vegetables, and fruits. They were also very destructive in De Witt, Blanco, and Kendall. In San Saba, their presence delayed corn-planting till May 1. In Murray County, Minnesota, these pests appeared June 12, and ruined many late-sown crops. In Jackson they appeared in countless numbers and remained about a week, eating up the crops very clean. In Cottonwood they appeared June 15, coming from the southwest, and were very destructive, especially upon the wheat-crops, reducing the yield of the county to only a half average. At the date of the report the young were beginning to hatch. In Blue Earth they were observed coming in the same direction.

Our correspondent in Martin County leaves the condition of spring wheat and barley without note, since both are now covered with grasshoppers. These appeared in the western and southwestern parts of the

county, June 17, and twenty-four miles more easterly on the 21st. They appeared about noon, on days of sunshine, high in the air, seeming in the sunlight to be of a silvery hue, their wings light brown. At first scattering widely, the second day at noon they appear in immense numbers, filling the air even to the ground. Gardens are first attacked, onions and cabbages fall before their ravages in the beginning, and, following, all tender plants, even tobacco and wormwood; next barley and wheat, the leaves of which they strip in patches. About the fourth day, increased in numbers, they make a united attack on nearly all kinds of grain—seeming to leave corn and peas comparatively undisturbed. About the seventh or eighth day they begin to rise, and, if the sun is warm and the weather clear, leave finally about the eighth or ninth day about noon. Millions of these insects may at that time be seen flying in the air in the wind direction. They began to leave Martin County on June 29, and four or five days had elapsed before all had gone. They injured but did not destroy the wheat-crop, some pieces being left almost unmolested, while others were badly stripped. Vegetable-gardens are generally ruined. A tract of two thousand acres of beans, planted by a company consisting of three Englishmen, who broke the prairie, has been to the extent of nearly three-fourths devasted by grasshoppers.

Our correspondent in Faribault states that the insects had just reached the west line of that county, going east. They had laid their eggs in the counties westward, where they will hatch next spring, provided the conditions of incubation are not disturbed.

In Burt County, Nebraska, the young insects were hatched out in immense numbers.

In Pocahontas County, Iowa, they appeared, in the fore part of June, in an army thirty miles from front to rear, moving eastward on the ground till noon, when they took flight, flying very high. Their rear passed two weeks after their front had first appeared. They destroyed 50 per cent. of the crops. In Emmett the barley was entirely destroyed and other grains seriously damaged. Greater or less injuries are reported in Cherokee, Calhoun, and Woodbury.

In Burt County, Nebraska, the young insects were hatched out in immense numbers too late for small-grain crops, but not too late for corn. They also appeared in Boone and Dixon in large force, where they deposited their eggs and did much mischief. Our correspondent in Dixon, after careful examination, is satisfied that not over a third of the eggs deposited were hatched. They hatched out largely in Larmer County, Colorado. In San Luis Obispo, California, they were destructive on grain-crops, while in Fresno they were equally injurious to corn and cotton.

Colorado potato-beetle, (Doryphora decem-lineata.)—This insect is still developing eastward and northward. In New York it had appeared in four counties, viz, Wyoming, Niagara, Allegany, and Chautauqua; in the latter it was quite mischievous. Pennsylvania received a more general visitation, not less than thirteen counties reporting the presence of these pests. They were very severe in Huntington, Fayette, Beaver, Jefferson, Crawford, Forest, and McKean; less serious damages are reported in Snyder, Cambria, Butler, Cameron, and Berks. In Elk County they attacked the early-rose potatoes which had previously been exempt from their ravages. In McKean the beetles appeared May 1, and their young began to hatch out in the third week following. The ravages of this beetle constituted almost the whole of the casualties to the crops from insect enemies in this State.

Our correspondent in Union Parish, Louisiana, describes an insect feeding upon the potato, which he supposes to be a larva of the *D. decemlineata*, but his description is not sufficiently accurate to distinguish it from another species, *D. juncta*. It is a broad, stumpy worm, nearly as broad as long, head, black; color, reddish brown, with black spots extending along the sides of the body.

In Randolph, West Virginia, the beetles were quite numerous, being picked off the vines. In Braxton, Barlow, Cabell, Marion, and Morgan, they were very destructive. They were also present in Doddridge and Kanawha, in the latter of which they were making their first appearance. In many cases they were effectually resisted by the farmers. Our correspondent in Tyler speaks of a species of potato-bug but little known and very destructive. Some farmers sprinkled lime on the vines, and others turned in their chickens. He would confer a favor by sending a specimen to the Department. Six counties in Kentucky report the presence of this insect. In Spencer a third of the potato-crop was destroyed, but in Henry, Livingston, Anderson, Fayette, and Shelby, the losses were lighter. The ravages of the beetle were here successfully resisted either by sprinkling Paris-green upon the vines or by shaking them off into vessels and destroying them wholesale. In Henry the lady bug (*Coccinella*) destroyed the eggs of the beetles in great numbers.

North of the Ohio River this insect is reported in every direction. In Ohio, the destruction was mostly in the northern counties, though the beetles were threatening in Highland, in the southwest. In Washington and Meigs, in the southeast, fear of the pest had greatly restricted potato-planting and hence the insect had but little to feed upon. In Morrow the crop was cut down one-half; in Franklin, 20 per cent. in spite of strenuous resistance; in Trumbull, the entire crop was threatened; in Logan, the beetles re-appeared in apparently undiminished numbers after every effort for their destruction. Great havoc is also reported in Stark; some Swiss residents of this county state that this beetle is known in Switzerland. In Mahoning, Medina, Portage, Geauga, Marion, and Noble the insect was more or less injurious. In many cases it was destroyed by persistent and intelligent efforts, and the crops substantially saved. They were destructive also in several counties of Michigan, such as Lapeer, Manistee, Mason, and Branch. In Antrim, however, "the farmers have the inside track," while the annoyance had perceptibly diminished in Monroe, Benzie, Tuscola, Shiawassee, and Hillsdale. The beetles were very numerous in Johnson, Martin, Cass, Dubois, and Orange Counties, Indiana. In Howard, the lady-bug was efficiently destroying them. In Franklin they were less troublesome than last year. Paris-green was extensively used in some counties with varying success. Great damage was done in Mercer, Ogle, Boone, Lake, Winnebago, and Bureau Counties, Illinois, while in Stephenson, Montgomery, and Madison they were of small import. La Crosse County, Wisconsin, reports an increased number, while in Columbia, Adams, Juneau, and Clark they were very troublesome. In Portage they were very thick, but were preyed upon by other insects to an increasing extent. In Ozaukee they had lost their terrors, being easily destroyed. In Brown abundant rains enabled the vines to grow in spite of them.

In Minnesota the devastations were more severe in Ramsey, Houston, Isanti, Meeker, and Wright Counties, while in Renville they were less numerous than formerly. Our correspondent in Rock reports a new potato-bug as destructive as the striped bug. He will greatly oblige us by sending a specimen. Only three counties in Iowa—Tama, Winneshiek, and Muscatine—report the presence of the Colorado beetles;

their ravages were severe in some localities. Missouri reports only a few localities in Vernon County visited by these pests. They were numerous and demonstrative in Dixon County, Nebraska, and were present in Clay, Boone, and Merrick. They were also reported in Clay, Bon Homme, and Sioux Falls Counties, Dakota.

Cut-worms, (*Agrotis*, sp.)—Different species of this genus appeared in different parts of the country. They were very destructive of corn in Niagara and Livingston Counties, New York; in Baltimore, Saint Mary's, Washington, Howard, and Frederick Counties, Maryland; Clarke, Southampton, and Alexandria, Virginia; Marshall, Alabama; Washington and Knox, Tennessee; Jefferson, West Virginia; Tuscola and Gratiot, Michigan; Huntington, Indiana; Washington, Illinois; and Wahsatch, Utah.

Grub-worms, (*Lachnosterna*, sp.)—Grub-worms injured different crops in Fayette County, Pennsylvania; Montgomery and Kent, Maryland; and Mercer, West Virginia.

Hessian fly, (*Cecidomyia destructor.*)—This insect cut down the wheat crop one-half on limestone lands in Fulton County, Pennsylvania. It also appeared in Washington County, Maryland, and in Orange, Loudoun, Halifax, and Clarke, Virginia; in the last-named county it was very destructive, some farmers turning their animals to graze upon the remains of the wheat-crop. It is reported in Hardy, West Virginia; Russell, Kentucky; Franklin, La Porte, and Decatur, Indiana; and Wright, Missouri.

Grass army-worm, (*Lucania unipuncta.*)—The farmers of Northumberland County, Virginia, mowed somewhat prematurely in order to save their grass from the army-worm. This insect was destructive in Dubois, Indiana; Franklin, Perry, Edwards, Illinois.

Chinch-bug, (*Micropus* [*Rhyparo chromus*] *leucopterus.*)—Chinch-bugs injured wheat, corn, and oats to a serious extent, especially west of the Mississippi River. The only county east of the Alleghanies infested with them was Halifax, Virginia. They were troublesome in Hardy, West Virginia; Russell, Kentucky; Putnam, Indiana; Cass, Scott, and Marion, Illinois; Wright, Vernon, Phelps, Cedar, Reynolds, Ralls, Lawrence, Jasper, Boone, Bates, Benton, and Henry, Missouri; Howard, Wilson, Neosho, Labette, Cherokee, Bourbon, and Woodson, Kansas. In Labette County our correspondent saw stalks of corn free from bugs in the morning, but covered two or three deep on the evening of the same day to the height of eight or ten inches from the ground. In a few days such stalks would be dead and fallen down. In Green and Dane Counties, Wisconsin, their depredations were restrained by heavy rains.

Wheat midge (*Diplosis tritici*) is reported in Mercer and Cabell Counties, West Virginia, and Henry and Shelby, Kentucky.

Cotton-caterpillar or army-worm (*Anomis Xylinæ*) appeared in Suwannee, Liberty, and Leon Counties, Florida; Clarke, Saint Clair, and Wilcox, Alabama; Jasper, Marion, and Wilkinson, Mississippi; West Feliciana, Tangipahoa, Cameron, Rapides, and Carroll, Louisiana; Galveston, Victoria, and Austin, Texas.

Boll-worm (*Heliothis armigera*) injured the corn-crop in Wilkinson County, Mississippi.

Cotton-lice. (*Aphides.*)—Lice appeared in cotton in Macon, Franklin, and Coweta Counties, Georgia; Saint Clair County, Alabama; and Fulton County, Arkansas.

Our correspondent in Powhatan County, Virginia, reports an unknown insect in the rye, which has received the local designation of rye-flea.

An unknown insect was destroying grapes in Calhoun County, Alabama.

Rose-bug (Macrodactylus subspinosis) injured fruit-trees in Monroe County, West Virginia.

Canker-worm, (Anisopteryx vernata.)—These worms destroyed a third of the orchards of Winnebago County, Illinois. Our correspondent suggests as an effective preventive a slip of wooled sheep-skin three inches wide, wool outward, nailed round the tree next the ground very early in spring.

Apple-worms, (Carpocapsa pomonella.)—The ravages of the apple-worm reduced the apple-crop of Whiteside County, Illinois, fully one-fourth.

Tent-caterpillars, (Clisio campa-disstria.)—These insects injured fruit and shrubbery in Edward County, Illinois, and in Clarke County, Iowa.

Squash-bugs, (Gonocerus tristis.)—These pests were numerous in Bureau County, Illinois. A solution of hen-manure was found to be an effective remedy.

CHEMICAL NOTES.

By Wm. McMurtrie, Chemist.

Nitrogenous wastes.—In a note by M. L. L'Hote to the Academy of Sciences of Paris, which was published in Comptes Rendus, he describes a method for the utilization of nitrogenous wastes, which, while it has the merit of affording a means of getting rid of much useless material, has also the disadvantage of being quite expensive, and on this account it may prove unprofitable. The process depends upon dissolving the nitrogenous wastes in a one-tenth solution of caustic soda in the cold, or by heating carefully in order to avoid production of ammonia, in this way obtaining a solution, or, at least, a complete disintegration of the material. The viscous solution thus formed is mixed with sufficient slaked lime to form a pasty mass, and the whole placed in a close vessel connected with a receiver containing sulphuric acid, (chamber-acid,) and the mixture heated carefully at a low temperature to avoid dissociation of the ammonia. After the disengagement of gas has ceased the temperature is raised to a bright red heat. When the operation is finished the residue consists of caustic lime and carbonate of soda, which, being treated with water, regenerates the soda, which may be used again. The sulphate of ammonia produced, which is colored, may be purified by crystallization.

A new opium.—M. P. Carles, in a communication to the Journal de Pharmacie et de Chimie, describes a new opium, said to come from Persia, which differs in some particulars from that of Smyrna. He describes it as follows:

> This opium exists under the form of conical loaves, weighing about 440 grams, and obtained from the leaves of poppy, portions of which remain. It is free from seeds of rumex, and its odor, unlike that of the opium of Smyrna, is not poisonous, but exactly like that of green coffee; but when it is heated it has a sensible odor of chocolate. It is soft like ordinary opium, containing 5.60 per cent. of moisture. When well dried it is easily pulverized, but it is slowly deliquescent. The color of the paste is tawny, and is not darkened by exposure to the air. Examined with the naked eye, or by the aid of a magnifying glass, it appears very fine and homogeneous. Unlike the officinal species, it mixes easily with water, without being worked up with the liquid. The solution is slightly colored.

The author has subjected the raw opium to titration, according to the method of Fordos, and obtained, as an average of two operations, the following results:

Morphine	8.40 per cent.
Narcotine	3.60 " "

The proportion of morphine is somewhat lower than that found in the species from Smyrna. It was suspected that it contained an abnormal quantity of sugar, but it was found difficult to establish this point by comparison, since all species of opium contain different amounts of this constituent.

ACTION OF COFFEE.—Aubert, writing upon the constituents of coffee, states that in roasting none of the caffeine is lost, but that it may be more completely removed from the grains if they are strongly roasted. When taken in large doses it seems to cause a decrease in the action of the heart. When taken in small doses the pulse becomes more active, but the pressure of the blood in the vessels decreases.

CLEANING WOOL.—Many of our farmers pay but little attention when cleaning wool to the kind of water used in the operation; but it will be seen that this should always be taken into consideration. Thus, waters containing lime should be carefully avoided, since this constituent combines with the suint, thus forming an insoluble soap, which seems to produce unpleasant effects in the processes of dyeing. For logwood, red-wood, and dyes of like character, the effect appears to be unimportant; but when quercitron, fustic, and madder are used the effect is quite different, and is often very deleterious.

PURIFICATION OF SUGAR BY OSMOSIS.—The manufacturers and refiners of sugar in our country would do well to follow the example of those of Belgium, some of whom have successfully applied osmosis to the removal of the crystallizable sugar from molasses obtained from the third crystallization. The advantages claimed for this method are, that the molasses remaining after this treatment sells for the same price as ordinary molasses; that the crystallization of the products of osmosis is effected in one-half the time required for that of ordinary sugars; that white sugars are thus obtained in much less time; that the number of crystallizing-pans may be reduced one-half; and that the products obtained are much less colored.

CAUSE OF INTERMITTENT FEVERS.—In the discussion of the power of certain substances to prevent putrefaction and the development of protoplasmic life, Mr. F. C. Calvert states that quinine sulphate will completely stop the growth of fungi, and that since this substance is so efficacious in cases of intermittent fevers it is probable that the latter may be the result of the introduction of fungoid growths into the system, and this seems more probable since these fevers are developed more extensively in swampy countries, where the decomposition of vegetable matter is so abundant.

COAL-ASHES.—The following experiments of M. Lebouf, of Argenteuil, upon the value of coal-ashes, shows that in the ashes alone, without an admixture of soil or any manure, plants may grow and come to maturity. Thus, having filled three pots with ashes, he planted in the first wheat, in the second oats, and in the third strawberries. The growth was accomplished during the summer, the wheat and oats ripening and producing full heavy grains. The straw of the wheat attained a height

of about 4 feet 6 inches, while that of the oats grew to about 3 feet 6 inches. These experiments have been several times repeated, with the same success.

ANIMAL FARINA—NEW FOOD FOR BEASTS.—The journal of the Central Society of Agriculture in Bavaria gives a curious report upon the utilization by agriculture of the residuum obtained in the preparation of the extracts of meats by the process of Dr. Liebig. At Fray Bentos, Uraguay, about 700,000 pounds of this product, the greater part of which is consumed in Europe, is prepared annually. It is obtained by throwing finely minced meat into water at the temperature of 61°, and evaporating the broth until it has acquired a sirupy consistency, always taking the precaution to carefully remove the fat upon the surface. About 200 pounds of fresh meat will prepare 6 pounds of the extract that is brought to the market.

The meat thus boiled, and which constitutes the residuum of the operation, has until of late been only imperfectly utilized, and has been destroyed by incineration, or by being thrown into the river. Lately, however, it has been used in the preparation of a fertilizer. Recently Liebig suggested the idea of utilizing this matter, which is so rich in nutritive properties, as food for domestic animals; and it is interesting to inquire if this end can be accomplished, as at Fray Bentos nearly 500,000 pounds of this dried residuum are annually produced. In order to appropriate the waste to this use, it is dried and reduced to powder. Samples of this new product having been sent to Munich, experiments were made with it upon swine, as it appears, with very advantageous results. In the agricultural review of the Journal des Debats M. G. Fouquet gives the following very clear and interesting information:

The pulverized material when completely dried is of a grayish color, and presents in its composition a ratio of 73.52 per cent. of albuminous matter, and 12.70 per cent. of fatty material.

A comparison of the composition of this animal farina and the fodders most frequently used shows that the former is much richer in nitrogen and fatty matter. In fact it contains three times as much of albuminous matter as vegetable fodder, and two and a half times as much as oil-cake, including also the same quantity of fat. No food can be complete if to the fatty and nitrogenous materials there is not united a certain quantity of salt, of the phosphates of lime and potassa, chlorides that exist in all the tissues and fluids of the animal organism, and for this reason the meat-flour does not possess the desirable qualities, as the process to which it has been submitted robs the muscular flesh of the salt that abounds in the extract given to the market.

The analyses of M. Lehmann, president of the Agricultural Society at Munich, have demonstrated that the meat of dried beef contains ten times as much of the phosphate of potassa and the chloride of sodium as that which has been treated by the process of Liebig. Vain attempts have been made to nourish dogs with the animal flour. After a short time the dogs would refuse this food, and if they were persistently and exclusively fed with it they died. But if the precaution was taken to add to it the salt of which it had been deprived, the results were very different. The dogs would then consume their rations with avidity, and rapidly increase in weight.

M. Lehmann selected the pig as the subject of his experiments, as it is well known that this animal can be sustained on either vegetable or animal matter. In his experiments potatoes were added to the pulverized residuum of the extract of meat. Two series of attempts were made. In the first, in order to replace the salt contained in the fresh meat, Lehmann made a substitute of the chloride of potassium and the phosphate of soda. In the second trial, considering the potatoes as sufficiently rich in alkaline salts, he only added the phosphate and carbonate of lime.

The experiments were made upon five gelded pigs of the Yorkshire breed, two of which were born on the 15th, and the other three on the 20th of August. In order to satisfy himself that the young animals were endowed with the same aptitude for assimilation, the experimenter submitted them to a preliminary trial, which demonstrated that they utilized all food with the desirable uniformity. This trial was followed by the experiment which was to ascertain the nutritive worth of the meat-flour, and which begun on the 18th of November, and continued until the 31st of December. The animals were separated into three divisions. The first two divisions, each comprising

two subjects, were fed with the meat, and the third was nourished exclusively upon potatoes. As we have said, the meat-flour was accompanied by potatoes, and the mixture, to which was added 16 grains of common salt, was always reduced to a kind of broth by means of tepid water. The nourishment of the first lot was completed by 10.7 grams of the phosphate of soda, and 4.4 grams of chloride of potassium. To that of the second lot was added an equal mixture of phosphate and carbonate of lime. The mixture of meat and potatoes was consumed with avidity, and from the third day the animals of the first lot evinced so great an appetite that their ration was increased by the addition of potatoes.

During the forty-four days of the experiment, the animals of the first lot each consumed 219 kilograms (about 500 pounds) of potatoes, and 10.37 kilograms (25 pounds) of animal farina. Those of the second lot ate 208.75 kilograms (485 pounds) of potatoes, and 10.37 kilograms (25 pounds) of meat; while the hog of the third lot consumed 207.75 kilograms (484 pounds) of potatoes. At the close of the experiment the animals weighed as follows:

	First lot.		Second lot.		Third lot.
	Pounds.		*Pounds.*		*Pounds.*
November 18	58	63	58	58	58
December 31	124	124	119	119	86
Increase	66	61	61	61	28

As will be seen, a small addition of meat farina to the potatoes was sufficient to double the weight of the animals during the period of the experiment. The result shows that 100 pounds of potatoes alone gave an increase of 14 pounds in weight, while the same quantity of potatoes mixed with a small ration of meat-flour, (11 pounds,) in the same duration of time provided an increase of 29 pounds in weight.

ALCOHOL IN BREAD.—Mr. Thomas Bolas, in a communication to the Chemical News of May 30, states that the idea that the alcohol formed in the panary fermentation of bread is completely removed by the process of baking, is a mistaken one. By experiment he has established the fact that when about two ounces of ordinary bread is mixed with water and distilled, and the distillate is afterward purified, a perceptible quantity of alcohol may be obtained. Quantitative examinations of six samples of new bread, purchased at different shops in London, show the following results:

	Per cent.
I	0.245
II	0.221
III	0.401
IV	0.368
V	0.249
VI	0.339
Average	0.314

BOTANICAL NOTES.

By Dr. GEORGE VASEY, Botanist.

SUPPOSED AMERICAN ORIGIN OF RUBUS IDÆUS, (THE GARDEN RASPBERRY.)—Our cultivated raspberry is an importation from Europe. Our native red raspberry, (*R. strigosus*,) however, is so near it that the specific distinctness has been in doubt; and specimens from British America and the Rocky Mountains certainly occur which a botanist

must needs refer to *R. Idæus* itself. In his studies of the European *Rubi*, Professor Areschoug (in Botaniska Notiser, 1872, and in a translation by himself in Trimen's Journal of Botany, April, 1873,) makes prominent and important the fact that *R. Idæus* has no near relative, or, in other words, is the sole raspberry, in Europe, but in mode of growth, in the bark, &c., as well as in the fruit, accords with American species, with one of them so closely that all who have come to the conclusion that species have a history must needs infer a community of origin. Areschoug concludes, accordingly, that "this species did not originally have its home in Europe, but its origin is to be found in the east of Asia, viz. Japan and the adjacent countries, or perhaps in North America." It is one of the members of that old boreal flora (as we suppose) now mainly East Asiatic and North American, which has found its way to, or held its place in, the north of Europe somewhat exceptionally. Both *R. strigosus* and *R. Idæus* inhabit Japan and Mandchuria, and Maximowicz regards them as forms of a common species. Professor Areschoug adopts the now familiar idea "that the Asiatic and North-American floras have reciprocally mixed with each other by passing Behring's Straits and the islands which in its neighborhood form a bridge between the two continents," which is a partial explanation of a problem that has to be treated far more generally, now that we have reason to believe that this flora formerly filled the Arctic Zone. (Dr. A. Gray, in the American Journal of Science and Arts, June, 1873.)

ANEMOPSIS CALIFORNICA—A NEW MEDICINAL PLANT.—Mr. J. J. Warner, of Los Angeles, California, who it appears is an old resident of that country, has recently written to Professor Henry, Secretary of the Smithsonian Institution, a letter respecting the medicinal qualities of a certain California plant. The letter and the package of roots accompanying the same was referred by Professor Henry to the Agricultural Department as coming within the range of its operations.

Mr. Warner states that he has been acquainted for some fifteen years with the medicinal properties of the plant of which he writes, and in his own person, and the persons of others, has known it to have remedial powers of unusual efficacy in the treatment of diarrheas and bowel complaints, and externally for bruises, for inflammations, and for old ulcers.

The use of the plant has heretofore been restricted principally to the Indian population, and to domestic practice among the residents of California.

Mr. Warner writes with apparent calmness and candor, and says that he has for several years entertained the desire that this remedy should be more generally known, and in pursuance of that desire has made the communication here related. His desire has been quickened of late by the reports of the prevalence of cholera in the Atlantic States, which disease he thinks might be prevented or mitigated by the use of this remedy if taken in season. Some dried specimens of the plant in a flowering state were sent, by which it is identified as the *Anemopsis Californica*, a low herbaceous perennial of the natural order Saururaceæ. It seldom grows over a foot or a foot and a half high, with a thick, creeping root-stock, which is somewhat spongy in texture, of a brownish or reddish color, and of an aromatic, slightly astringent taste.

Dr. Edward Palmer, who has traveled in California, Sonora, and Arizona, as botanical collector for several of the Government surveys in that region, reports that the plant is highly esteemed as a medicinal plant among the Indians in the above-mentioned countries, where it grows. The roots have been placed in the hands of Dr. Toner, President

of the American Medical Association, and will be given to competent medical men, that their properties may be carefully investigated.

GRASSES FOR THE SOUTH AND SOUTHWEST.—Specimens of *Bromus unioloides*, Willd., which is the *Bromus Schraderi*, Kunth., (a truly American, and not, as has been stated, an Australian grass,) are frequently sent in from Texas, and generally with very encouraging statements of its value as a suitable grass for that section of country. Recently Mr. Louis Lehmann, of Brenham, Texas, has sent specimens of "a native winter-grass, which springs up in November or sooner, as the rains set in; it grows all winter, and is fit to cut for hay by the 1st of April. Cattle and horses eat it very greedily." Mr. Lehmann thinks it will be a great acquisition. It appears to be the *Phalaris Americana*, Ell., much resembling the *Phalaris arundinacea*, L., or Reed-Canary-grass, which is common in wet swampy grounds in the Northern States, but the Texas species is smaller and softer, intermediate between the Northern species and the common Canary-grass which produces the Canary bird-seed. It is well worthy of experimental trial by the farmers of Texas and the Southern States.

NORWAY OATS.—Mr. C. A. Sullivan, of Starkville, Mississippi, sends to the Department a specimen of the "Norway oats," and also one of the common black oats. The former specimen was grown from seed distributed by the Agricultural Department.

The two were grown on very poor soil—red-clay hill. The Norway stalk has ninety-one well developed seeds, while the other has thirty-seven faulty ones; the difference in the size and strength of the stalk is equally as great. Both were planted at the same time and grew within twenty feet of each other.

SALT OR MINT WEED—*Iva axillaris*, Pursh.—Mr. William Budge, of Paris, Utah, sends a specimen of "a very obnoxious weed, called by the farmers in this section salt or mint weed." Mr. Budge says that its roots penetrate sometimes as much as fifteen feet into the earth, and it increases so fast and is so injurious to crops that it threatens great damage to that section of country. It is a low insignificant plant, very abundant in the valleys of Utah. It also occurs in Colorado. We solicit further information respecting it.

FRUIT-GROWING IN INDIANA.

A correspondent in Clarke County, Indiana, sends to the Department the following account of the rise, progress, and profits of fruit-culture in the vicinity of Otto:

Fruit-growing as a specialty in the vicinity of Otto is a comparatively new industry, having been introduced within the last fifteen years. From a small beginning, under circumstances somewhat unfavorable, it has become one of the leading industries of this locality.

The pioneer fruit-grower in this section, Mr. Argus Dean, in the spring of 1857 procured 1,600 peach-trees from a nursery in New Jersey, which he set upon a bluff of the Ohio River, immediately in rear of Marble Hill, and about two miles northeast of Otto. This orchard bore its first crop in 1861, and two successive crops, when the cold storm of the 1st January, 1864, so injured the trees that they never entirely recovered. They were cut away several years ago. It is not to be presumed that this first effort proved highly remunerative, yet it convinced Mr. Dean that fruit-culture might be made profitable in this locality, and he resolved to prosecute the business on a more extensive scale. For this purpose he purchased an old farm, the soil of which,

never strong, was badly exhausted. The ground was first prepared by being well broken with a turning plow and a portion of it was sub-soiled. In 1861 he set upon this farm about 1,800 peach-trees. They were set in alternate rows, both ways, with apple-trees. This peach-orchard has been very successful, having borne four good crops. In 1866 he set 2,000 peach-trees on adjoining ground, which bore a partial crop in 1871, and an excessive one the past season. His next peach-orchard consisted of about 5,000 trees, which were set in 1868 and produced a crop the past season. In 1870 he set about 6,000 peach-trees on the river bluff opposite Westport, Kentucky. If the season should prove favorable this orchard will produce a crop in 1874, when he will have over 14,000 peach-trees in bearing.

Mr. Dean has about 25,000 apple-trees, 2,000 of which are in bearing, and consist almost entirely of such varieties as have been proven to be adapted to this climate and soil. He has 500 trees of the famed cider-apple, "Hughes's Crab." For the cider made from the fruit of these trees he finds a ready sale at $15 per barrel.

On account of having to handle such a large quantity of raw peaches this season and the difficulty of obtaining good help, the canning and preserving department had to be conducted on a smaller scale than was first intended. It amounted to 350 dozen of three-pound cans of peaches, and about 100 dozen of peach-preserves, jellies, &c.

Of the apple product he will make about 50 barrels of crab-apple cider, and 1,000 gallons of apple-butter, selling but a small quantity of raw apples.

Mr. Dean finds the best market for raw peaches in Cincinnati, and for preserved fruits in Louisville. The raw peaches he sent to Cincinnati this season amounted to something over 4,000 bushels, commanding a good price throughout the entire season. The gross receipts from all kinds and conditions of fruits will be something over $10,000, but the outlay has been larger than usual in such business. His peach-orchards are plowed at least twice each summer, pruned and wormed, and the fruit is thinned when the crop is excessive. In the preserving departments the best refined sugar is used, even in the apple-butter, and everything is done with the view of producing a first-class article in every department; for such, a first-class price can always be obtained.

Mr. William S. Dean commenced operations in the spring of 1867, by setting 2,000 peach-trees and 700 apple-trees. In 1868 he set 350 peach-trees, and 500 in 1870. Last spring he set 1,500 peach-trees, and has made arrrangements to set 900 peach-trees and 800 apple-trees the next spring. Mr. Dean furnishes the following statement of the proceeds of his peach-orchards: Sold at Cincinnati in 1871, 375 bushels, amounting to $1,012; at other points 80 bushels, amounting to $120; sold at Cincinnati in 1872, 2,458 bushels, amounting to $5,648.20; at other points 100 bushels, amounting to $150. Average daily shipments during the past season 44½ bushels. His apple-orchard, consisting principally of tested varieties, prominent among which is the Hughes's Crab, are located upon the bluff of the Ohio at an elevation of about 365 feet above the river, its geological character being that of the gray or cliff limestone, natural underdrain.

In the spring of 1868, Mr. Jonathan C. Davis, of Clermont County, Ohio, and Mr. William S. Greene, of Cincinnati, entered into copartnership for the purpose of cultivating fruit in this vicinity. For this purpose they procured a piece of land in rear of Otto Landing, on which they set between 5,000 and 6,000 peach-trees the first season, and about 5,000 on another piece of land in the same vicinity, and they have since that time set out between 5,000 and 6,000 more. In 1871 the proceeds of their peach-crop amounted to $1,000; this, however, included the crop from a small orchard which had been previously planted on the premises. The crop of 1872 amounted to 3,227 bushels, and the gross receipts to $7,740. The season commenced on the 17th of July, and ended on the 4th of October, the shipments averaging 46 bushels per day.

Mr. Davis is said to be the pioneer peach-grower of the West, having planted an orchard in Clermont County, Ohio, in 1847. In that locality he carried on the business extensively and successfully for many years. He is emphatically a peach-grower, having given his whole attention to that branch of fruit-growing. As a result of his long experience he is thoroughly posted on three essential points, viz: How to grow peaches; how to pick and pack them; and how to sell them. He has lately purchased a tract of land containing a little over 300 acres, and embracing the finest location for a fruit-orchard in this region. On this he will set 20,000 trees this spring, and will set so much of the remainder as may be adapted to that purpose in a short time, perhaps next spring.

The peach-crop of the past season was very large, amounting in the aggregate to 9,985 bushels. The season commenced about the middle of July, and closed the first week in October, during which period the shipments from Otto Landing averaged 143 bushels per day.

The peaches of Otto have become celebrated wherever known, and command the highest price in some of our principal peach-markets; consequently the growing of this fruit has become a leading branch of industry here, and from present indications it is reasonable to presume that at no very distant day all the tillable land on the river-bluffs in this region will be occupied with orchards. The peach does not seem to require a strong soil, and it is the opinion of some of the growers here that certain va-

rieties can only be successfully grown on very poor soil. As to the correctness of this theory the writer is not prepared to decide, but he is convinced from observation that peaches of large size and superior quality can be produced on very thin soil.

This is a favorable locality for the growing of both peaches and apples, compared with the general character of the western country. The under stratum of rocks, known as the cliff limestone formation, crops out about ten miles above Madison, and dips beneath the old red sandstone at New Albany, which latter formation forms the range of hills known as the "Knobs," and this peach-region lies about midway of this cliff formation. Of all sections underlain by the cliff stone, where the surface is level for any great distance, the soil is necessarily wet, and it is only where the rocks have been cut through by the Ohio River and smaller streams that the soil is dry. This dryness is on account of the rocks having been exposed to the drying influence of the atmosphere for a long period of time, so that by shrinkage cracks and open fissures have been made, leading from side to side of the declivities formed by the river and streams. Those cracks afford the most perfect underdrainage, which in process of time has changed the nature of the subsoil from a white, tenacious clay to that of a red, friable earth, and wherever this kind of subsoil prevails in this formation both peaches and apples do well, if properly cared for. It should, however, be understood that the excellence of all our improved fruits depends more upon artificial appliances than upon any peculiarity in natural causes. This is proven by the fact that we have as great extremes of success and failures in this locality as they have elsewhere.

The points upon which the peach-growers of Otto principally depend for success are thorough cultivation, pruning, and worming, and where the crop is excessive thinning is practiced. In picking and packing, the fruit is handled with great care. The boxes are made of the proper size to hold full measure. In packing, the deceptive practice of "putting the best on the outside" is not allowed.

RAISING SILK-WORMS IN THE OPEN AIR.

An experiment in silk-culture of very considerable interest and importance is now in progress in England, at the international exhibition at South Kensington, which is based upon the accepted principle that prevention is better than cure. It is known that silk-worms are liable to various and sometimes very grievous diseases, attributed, no doubt with good reason, to the unnatural condition in which they are reared, in unhealthy confinement, and deprived of the influences of the open air, so essential to the sound development of all animal life. The infection has been for some years universally prevalent in the silk-producing districts of Europe, being transmitted from generation to generation, producing increasingly debilitated progenies of worms, till at last the extermination of that invaluable race of insects and the ruin of the silk-growers seemed almost inevitable. Japan was for a time the only source of healthy eggs; but large importations from thence into Europe have, from some cause, been found to be at least partially diseased.

In this state of things Dr. Chavannes and M. Roland, in Switzerland, have conceived the rational idea of preventing, by simple means, diseases which science has found to be without cure. Their plan, which has been tried in Switzerland with promising results, and is now being tested at South Kensington, is merely that of restoring the silk-worm to its natural conditions, by rearing it in the open air on the mulberry-tree itself, and thus of producing, under circumstances dictated and demanded by nature, a healthy, uncontaminated race of silk-worms.

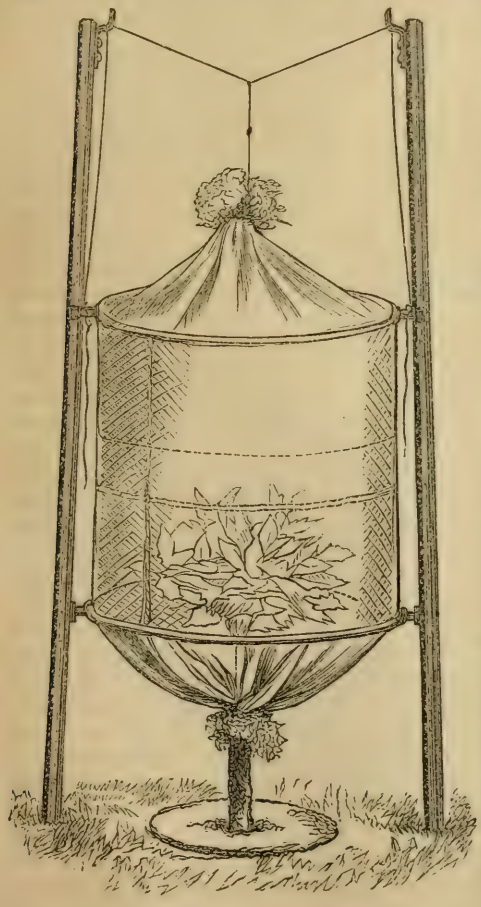
M. Roland, who appears to have elaborated this plan very carefully, has published a pamphlet containing a treatise upon the subject, in which he maintains that "by rearing on the tree, and especially by allowing the eggs to remain on the branches throughout the winter, the worm becomes more robust, and after some years returns to a state of nature. Ultimately the larva has nothing to fear from violent wind, heavy rain, or burning sun, and remains firmly fixed on the branches or

on the leaves. The pattern on the wings of the moth becomes more strongly marked, its movements are much more lively, and it makes use of its wings as much as its naturally sluggish nature will allow it to do." The singular entomological fact is stated, that at first the silk-worm has much difficulty in holding on to the tree in very windy weather, and often lets itself drop by gnawing through the stalk of the leaf on which it is feeding; but in a few years the caterpillar becomes stronger and more lively, the moth more alert, and the insect "completely regenerated," and its eggs, exempt from disease, promise an unfailing return for the following year.

The mulberry-trees, in accordance with M. Roland's plan, are grown as standards, headed down at a height of three feet, so as to resemble a standard rose. They are pruned or pollarded every spring, the object being to secure the formation of a number of young shoots, with fresh, tender leaves, the older, harsher leaves not being suitable for the insect's food.

The annexed cut, copied from the London Gardener's Chronicle, will illustrate the method of proceeding.

Over the head of the tree, as will be seen, is fixed a hood or cover of wire gauze and canvas, about three feet in diameter, the top and bottom being made of fine painted canvas. This hood is slipped over the tree, the lower end being tied carefully round the trunk, with intervening wadding, so as to prevent injury to the tree, as well as egress of the worms or ingress of other less desirable insects. The silk-worms are placed on the head of the tree through the upper opening of the hood, which is then closed carefully, like the bottom. Two stakes, one on either side, are then thrust into the ground, and the hood is made fast to them to secure steadiness. In spring the worms are hatched naturally at the same time that the shoots make their appearance, and when they have nearly eaten the leaves of one tree they are shifted to another. Thirty trees and ten hoods will rear silk-worms sufficient to produce an ounce of eggs.



SILK-WORM REARING IN THE OPEN AIR.

It will be observed that this ingenious but simple contrivance contemplates only the rearing of worms in the open air, in a state of nature as it were, the great object being to secure healthy eggs and a robust race of worms. It is obvious that when it is desired to secure the most

abundant supply of cocoons, in the quickest manner, and at the least expense, a more artificial mode of rearing must be resorted to. Hence, M. Roland has contrived, for hatching eggs more expeditiously, what he calls a "magnanerie," which is a shed with a span-roof of shingle and sides of wire gauze, having blinds for shelter against the wind or direct rays of the sun. This shed is placed in the most airy situation, and precautions are taken to insure thorough ventilation and freedom from damp and the access of injurious insects. Cleanliness and free ventilation are the essential features of the system throughout. But, as will be seen, the rearing of healthy eggs and the rearing of silk are two very different processes; and it is to the former only and to the rational and simple method of accomplishing it, as recommended by M. Roland, that it is the present object to call attention.

AN ECONOMICAL LIME-KILN.

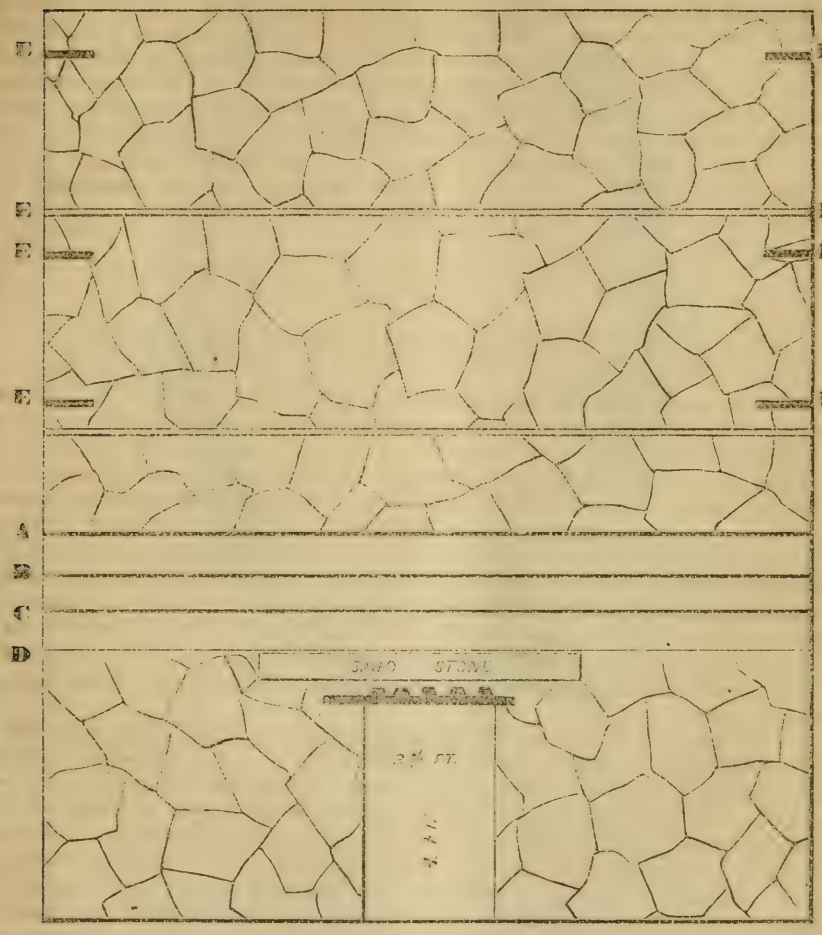
The value of lime for agricultural purposes has brought it into use wherever it can be obtained at a reasonable cost. The art of making it is so simple and easy as to allow every farmer who can cheaply procure limestone, (or shells,) to make it a part of his regular operations to burn his own lime. It is desirable, therefore, that he should have the means of doing so at the least possible expense. All that has been written for our reports, heretofore, on the subject of burning lime, has too many scientific details interwoven with the practical portions to be readily comprehended by the unlearned. What a farmer wants to know is how to build a kiln, how to fill and fire it, and how to use it, and how all this may be done at the least possible expense. I have undertaken to elucidate these points by drawings and directions which can be easily understood.

There are two classes who engage in burning lime. One pursues it as a business—to make profit by selling to others. The other burns lime for his own use. Of the first it may be said that the time occupied in the process of burning is an essential element in the success of his business; hence the construction of his kilns with expensive chimneys, to secure uninterrupted draught, even by means of blowers, when necessary—the only means of keeping his laborers constantly employed. But to the farmer, who burns lime for his own purposes, it is a matter of little importance whether his kiln burns out in twenty-four hours, (as it may be made to do, by artificial means,) or whether it occupies a week to produce the same result, because constant attention is not required as a matter of profit. Besides, it is a work which can be done at seasons when it will not interfere with the ordinary operations of the farm. The kiln once filled with stone and coal, and fired, may be left to do its own work, requiring only occasional regulation of the draught.

The kiln should be built in a side bank, so high that a wagon-load of stone driven near the top can be placed upon a platform, and there be broken into convenient sizes for burning, and from thence be thrown by hand or shovel into the kiln. This platform should be about four feet wide, and extend the whole length of the rear side of the kiln; and it should be as high as the wagon, and on a level with the top of the kiln, or nearly so. The kiln may be built of any kind of stone which will make a strong wall, and should be well bound throughout, on all sides, with planks and logs, as represented in the drawing. Without this,

the expansion and contraction, occasioned by the heating and cooling, would soon destroy the walls, however strong. The inner-wall should

1. Front elevation.

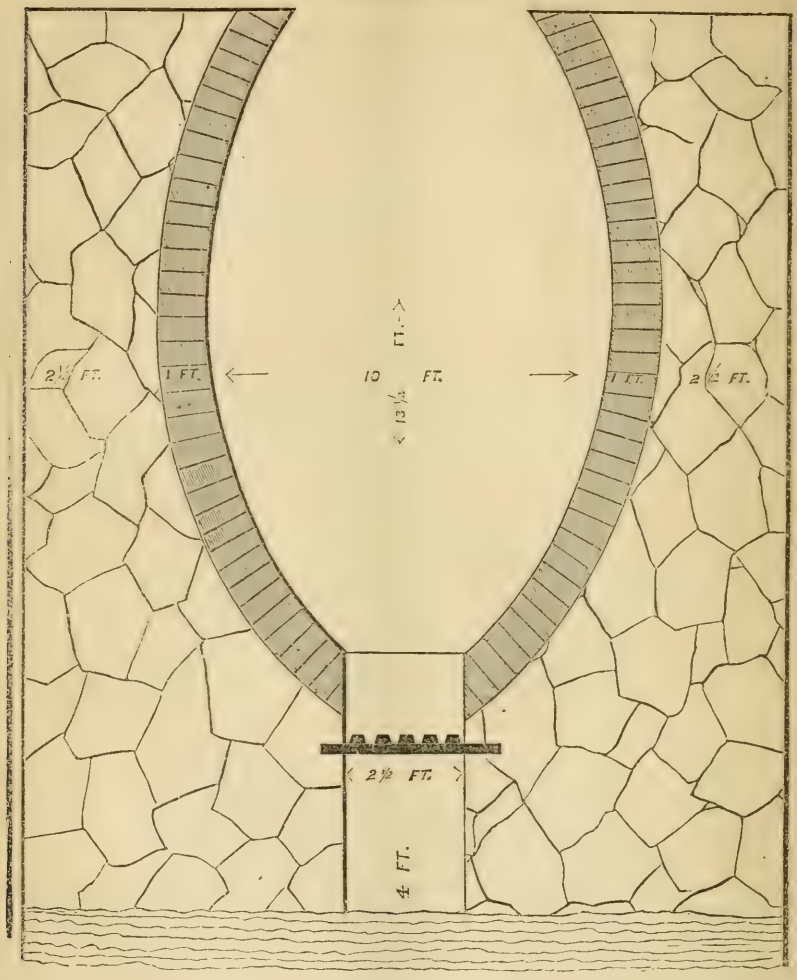


A B C D, timbers 12 by 8 inches, each log projecting 4 inches over the other.
E, planks 12 by 2½ inches, extending through the wall.

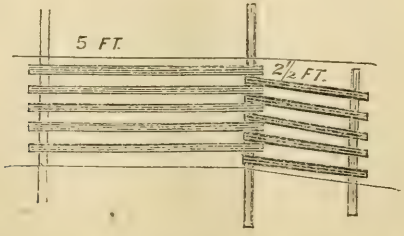
be a foot thick, and constructed of materials indestructible by heat, such as fire-brick, or soapstone—the latter being preferable. One thus lined, which I have had in use for many years, is seemingly as perfect as when built; and it is not even a pure soapstone, but "bastard," found in many places in the mountains of Pennsylvania and elsewhere. The iron bars of the grate should be narrower on the top than on the bottom, and they should rest loosely on cross-bars, so that they may be shoved to one side or the other, and allow the lime to pass through, as may be needed, when taken out. The hinder part of the grate should be elevated, so as to throw the lime forward as it is taken out at the front. This is either a draw-kiln, from which you may take the lime as

it is burned, and continue to fill at the top, or a permanent kiln, as you may please to use it.

2. Sectional view.



3. Bottom grate.



To fire the kiln, at first, the bottom, for two or three feet in depth, should be filled with dry materials, such as old stumps, rails, corn-cobs,

and the like; then put in the coal, and stone, (or shells,) in alternate layers, each deep enough to hide the preceding layer. Then fill the eye of the kiln with dry kindling-wood, and set fire to it. When the mass becomes thoroughly on fire, it may be necessary to close the eye of the kiln with boards, to moderate the draught; for, on very windy days, I have known the draught to be so strong as to carry the fire straight upward to the top, without perfectly reaching the sides.

On limestone farms, the fields of which require that the stones be hauled away as they are turned up by the plow, such a kiln is the place to put them, that they may be turned into lime when the farmer has little else to do.

ROTATION OF CROPS IN SWEDEN.

The Department has been favored by the Secretary of State with the following dispatch from the Hon. C. C. Andrews, Minister of the United States at Stockholm, in relation to Swedish agriculture:

LEGATION OF THE UNITED STATES,
Stockholm, June 28, 1873.

SIR: Having visited Mr. Alex. Dickson's estate, Kyleberg, near Ödishog, in South Central Sweden, to witness the operation of his steam-plow, and being favorably impressed by his skillful practice of agriculture, I requested him to have the kindness to put down in writing his system of rotation of crops, which he did, as follows, remarking that the soil, mixed clay and loam, though of first-rate quality, had been much exhausted during many generations before it came into his possession.

"I have," he states, "three various rotations, viz: 1st, fallow; 2d, autumn-sown rye; 3d and 4th, clover and seeds; 5th, vetches, cut green; 6th, autumn-sown wheat; 7th, mixed grain of barley and oats.

"*Second rotation.*—1st, Swedes, turnips, carrots, or mangel-wurzel; 2d, barley; 3d, and 4th, clover and seeds; 5th, autumn-sown wheat; 6th, mixed grain of barley and oats.

"*Third rotation.*—1st, mangel-wurzel, Swedes, carrots, or turnips; 2d, barley; 3d vetches, cut green; 4th, mixed grain.

"The last rotation is carried out on the lightest part of the land, and is what is generally called the Norfolk system. At present, I am giving the six years' rotation two root-crops in succession, in order to get the land thoroughly cleansed from weeds and put into first-rate order for the succeeding crops. It is my intention to give the seven years' rotation the benefit of two root-crops, (potatoes and Swedes or other bulbs,) after having gone over the six years' rotation.

"The manure is applied to the fallow or root crops. In order to secure a good crop of rye, it is almost indispensable to have fallow precede it. The farm-yard manure is from preference drawn out to the fields in winter on sleds, and put into large rectangular heaps, which ought to be covered over with peat-earth, or the earth round about the heaps. In spring, as early as the condition of the land allows, it is spread and plowed in for the root-crops, which ought to be sown very early, in order to secure a heavy crop. The fallow is manured after having been well wrought and cleared of weeds. The manure is then plowed in and left till shortly before the rye is sown, unless the fallow should require to be harrowed or quelled, to destroy weeds. I now give all the crops two hundred-weight of Balur guano superphosphate, which is applied to the winter-grain immediately before or after sowing, so that it may get harrowed in. For the spring-grain it is applied in the same manner; and for the root-crops it is sown broad-cast over the field just before drilling."

I saw Mr. Dickson's steam-plow in successful operation by his ordinary farm-laborers, who had acquired their skill on the place. He considers it, on the whole, economical, especially as it enables him to take full benefit of favorable weather.

I was particularly struck by his careful method of saving grain-seed. The soundest and best developed grain is selected for the purpose, and separately stacked and left unthrashed till near the time it is required for use.

As a general rule, the most cultivated and wealthy gentlemen of Sweden devote a good share of their personal attention to agriculture. The income from the larger estates is about 4 per cent. The rural beauty and charms of many, perhaps most, of

the larger country estates of Sweden, combining as they do arable field with handsome woodland, hill, valley, and lake, are scarcely anywhere surpassed; and no traveler should form a judgment of Sweden till he has seen something of them.

I have the honor to be, &c.,

C. C. ANDREWS.

Hon. HAMILTON FISH,
Secretary of State, Washington, D. C.

STEAM-PLOWING IN ENGLAND.

A communication on this subject from a farmer of Huntingdonshire, England, and kindly furnished to the Department by Mr. John C. Wallis, of Cumberland County, Virginia, will be found to contain facts of considerable practical value to those interested in this system of culture. The writer says:

I think it is cheaper than horse-power, since it requires three and sometimes four horses to do less than an imperial acre per day. I need not go into statistics to prove this further than to say that we bought our tackle in 1859, and are still using the same windlass and cultivator we then started with, and the former has not cost us £5 for repairs during the time, nor has the latter except for the wearing parts—the wheels and shares. We have had 1,000 yards of new wire-rope twice during the time, at a cost of £50 each time, and we now need 1,000 yards more. In regard to the engine, the cost is little compared to the work done, provided it is of sufficient power; a 10 horse-power is quite sufficient for our implements. Concerning the matter of the best system I am not in a position definitely to say, but my opinion is that, with a farm of, say, 1,000 acres or upward, Fowler's double-engine system might be employed to advantage; but on a farm of less size perhaps Smith's round-about plan would suffice. But on a farm consisting of land light and dry enough for a pair of horses to plow an acre and upward in a day, I have seen no system to supersede it at present, yet I do not say we may not. * * * but I can say that all my neighbors envy me the mode of steam-cultivation, both on account of the quantity and quality of work done, and the little cost of it. However, few farmers have sufficient capital to spare, £500, for a 10 horse-power engine and the proper plow. But if I had a farm of 300 acres of strong land, I would try hard to spare £200 for the tackle, even if I had to hire the engine to work it.

The cost of steam-cultivation stands something like this: I pay the men 3*s.* 3*d.* per acre the first time over, 3*s.* the second, and 2*s.* 6*d.* per acre if I go over it a third time with my large cultivator, and we average over six acres per day; so that the following is about the cost of a day's work:

	s.	*d.*
6 acres, at 3*s*	18	0
10 cwt. of coals, at 1*s.* 6*d*	15	0
Man and horse to supply water	7	6
Oil	1	0
Wear and tear and depreciation in value	10	0

In all, £2 11*s.* 6*d.*, or 8*s.* 7*d.* per acre, equal in United States currency to $2.14 per acre. I think you will agree with me that we cannot get the work done with horses for the same money, even without regard to the superiority of the work. I think in a former calculation I put the wear and tear at £1 per day, but experience has proved that too much; for, as our men get more accustomed to the work, the breakage is less; and now I have allowed 7*s.* 6*d.* per day for hauling water, whereas we often do without the horse. When it is near, a man can carry it.

As to the increased yield per acre of grain through this system, I think it has, with the extra assistance of increased quantity of manure, increased the yield about 8 bushels per acre, and in most seasons it certainly does assist the drainage and enables us to grow much more and better roots; but in such an exceedingly wet season as the last all the advantages disappeared in that respect. The land was like so much plastic clay, and although we grew some good roots, it was so wet that they could not be fed on the land. But then again the steam-plow came to our aid, for though we had to cultivate the land four times over and crush it with our heavy crosskill roller twice over with the engine, yet we got it to a better and finer tilth, and got in the oats better this spring than we could possibly have done with any amount of horse-labor; so that, although it has not quite realized all that some sanguine people expected, yet it is steadily increasing in use. A great deal has been done in this neighborhood this spring, but I think that 25 acres per day is the most I have heard of. Perhaps less than 20

acres may be considered the average with the double-engine plan. All who have used it seem satisfied with results, and with the advantage of being able to do so much work just at the right time. I have just broken up 10 acres of clover-land which had been pastured to sheep since the first week in April, and hope to get it ready for a crop of turnips this month (June) with but little horse-labor, thus setting them at liberty for other work. Therefore, I can only repeat that it has more than justified our continued use of it, and what I should do without it I scarcely know.

Our correspondent, Mr. Wallis, after referring to the fact that the writer of the foregoing has had fourteen years' experience in steam-plow cultivation, and further referring to the fact that in this country the price of labor is getting so high (alluding more especially to the South) that resort to more machinery is necessary to allow the raising of crops at a profit, says:

If I had had a steam-plow this year I could have put in at least 200 acres of corn instead of 50, and instead of 150,000 hills of tobacco, could easily have put in twice that number, with the same number of hands and horses. A corn-crop can be put in and worked entirely by steam; and in working a crop of corn I should think a 10-horse engine ought to plow 20 acres per day easily.

Mr. Wallis had five years' experience with the steam-plow in Europe.

POULTRY-RAISING IN FRANCE.

The Department is indebted to our Consul at Lyons, France, General J. P. Osterhaus, for some interesting statements concerning poultry-raising in that country. France feeds 40,000,000 hens annually, worth on an average 2 francs 50 centimes each, (50 cents,) or a total of 100,000,000 francs. The practice of making capons (emasculating the males) is very common, and the females are also rendered incapable of breeding, being unsexed—the French use in this connection the term *réformé*—and in that condition they are known as *poulardes*. This gives them a tendency to fatten, and is done when they do not promise well for laying, or have ceased to be fertile. Pullets of the largest breeds are generally selected for this purpose. About one-fifth of the 40,000,000 hens are so treated, and yield, at the above quotation, 20,000,000 francs. Besides the poulardes, 2,000,000 capons are annually sold, yielding 5,000,000 francs. The 40,000,000 stock hens produce every year at least 100,000,000 young chickens. If, of this number, 10,000,000 are allowed to replace the one-fifth sacrificed to Epicurus, and another 10,000,000 for various casualties, there remain 80,000,000 spring chickens, which, sold at 1 franc 50 centimes, (30 cents,) represent the sum of 120,000,000 francs. For the sake of accuracy, the enhanced value of the poulardes and capons must be taken into the account; this is not less than 6,000,000 francs, and raises the aggregate realized annually from the sale of the various kinds of chickens to 151,000,000 francs. Estimating the other products of the 40,000,000 stock hens at 240,000,000 francs, we have a grand total of 391,000,000 francs, ($74,000,000,) which the chickens of the French farmers annually yield to them.

Should the number of stock hens be increased to 150,000,000, as competent persons advise, the yearly earnings would not be less than 1,000,000,000 francs.

The Consul adds, that from his own observation the exportation of chickens has become a regular business. The district of La Bresse is particularly noted for the quantity and quality of its feathered products, and all France and neighboring countries prefer to purchase in that

region. The minute and scrupulous care bestowed on the raising, dressing, preparing, and packing of the fowl guarantees fully against the ordinary risks of transportation.

Henry IV, the most popular of the French kings, promised to make France rich enough by the wise measures of his great minister of commerce, Sully, to enable every peasant to have his chicken-roast on Sunday. Nowadays this would not appear an extravagant prophecy.

BEET AND BEET-ROOT SUGAR.

The immediate success of the manufacture of beet-sugar on the continent of America—and of its ultimate success there can be no doubt, now that public attention to the subject is thoroughly aroused—will be dependent upon two facts:

First. The proper selection of seed.

Second. The reducing of the principal product of the root to such a shape as to render its easy conveyance to the great centers an easy matter. On this latter depends the general and universal cultivation of the root, and until its growth becomes general and universal, the production of the sugar will be confined to a few localities more immediately adapted to its growth and to the easy manufacture of sugar.

The selection of the seed is of the first importance—of the various kinds of best beets grown for sugar. The roots may be classified into two varieties, viz., those which are slightly colored, and those which are white. Each class has its admirers. The red garden-beet is not used for sugar. In the first instance, and for a number of years, we shall have to rely on imported seed from the beet-growing countries of Europe, and therefore we shall, in a great measure, be dependent on the character and honesty of the seedmen importing from France and from Germany. Yet there seems to be no reason why we cannot grow our own seed when the principles of producing are understood.

The beet, like every other plant and production of nature, is susceptible of great and constant improvement. In its case, as in all others where plants are propagated by seed, "like has the greatest tendency to like," and therefore we may rely on it that the roots which are rich in sugar will produce seed for the succeeding crop, which will also be rich in sugar; and by constant and careful selection, a constant, although slow, improvement may be depended upon. When the root was first cultivated for sugar, 5 per cent. was considered a good yield; now 10 per cent. of sugar in the roots is of constant occurrence, and some of the most favorite kinds are known to produce 15 per cent. of sugar.

The difficulties in the way of selecting roots for seed consist in the fact that each root is a perfect plant, and that in order to insure improvement, each root which is to be planted for seed must be tested in one way or in another.

Vilmorin, the great seedsman of Paris, was a great improver of the root. His plan was to test every root before planting it for seed. He punched out a small piece of the root, reduced it to pulp, extracted the juice, and, by a set of very delicate instruments, he ascertained the specific gravity of the juice. The ropts which showed a great richness were planted for seed, while those under a certain average were rejected; the process did not interfere with the seed-bearing power of the root.

By this means he found that he could produce roots of even a greater

richness than the parent plant, and he followed out the course for a few years, until his "pedigree" roots would in the average produce double and eventually even treble the yield of sugar. He thus established a new kind of beet, which bears his name, and is now known as the "Vilmorin Improved." This root is partially colored, the skin being pink or reddish, and it grows considerably out of the ground.

Doubtless hundreds of other growers followed similar, if not the same plans, and the consequence has been a wonderful increase in the richness of the root in sugar.

It is not to be supposed that the general seed-grower will adopt this extreme course, but the fact of the possibility of improvement being once established, each grower will observe for himself and adopt his own course, and thus a greater or less degree of success and constant improvement will be certain to follow.

Of one thing we may be pretty sure, namely, that as the entire root increases in specific gravity so will its richness increase, and therefore a selection of the roots for seed becomes a comparatively easy matter.

The following plan may be pursued: Get a tub of water; make the water so thick with sugar that the richest root will barely sink in the mixture; then, as you dig and wash your roots, try all those you mean to keep for seed in this sweetened water. Those which sink, select for seed; those which float, reject, and let them at once go to the mill to be ground into pulp for sugar.

All the roots which you intend for seed should be again thoroughly washed so as to get rid of the medicine in which they were immersed, and they should then be carefully stored for setting out in the spring to produce seed.

It is necessary to make the trial of the root *as soon as dug*, because, let them be ever so carefully stored, some roots will dry more than others, and then those which dried least, although they might be poorest in sugar, would show the greatest specific gravity, while those which are richest in sugar might, if too much dried, show a light specific gravity.

There are various other methods by which those who observe closely will easily ascertain which of the roots are richest, and will thus be able to select, without so close a trial, the most promising roots.

The fact once ascertained that improvement is possible will surely lead to improvement being made.

Another great fact must be specially borne in mind, that the roots which are intended for seed must not on any account have their tops cut off. The outside leaves should be removed, but the small heart-leaves should not be removed or injured, for by so doing you injure the future stalk which is to bear the flowers and seeds.

It is also important to note the fact that the lower ends of the roots and the parts covered with earth are far richer in sugar than the tops and parts which have grown out of the ground. This difference can be made apparent by any one in the following manner: Take exactly the one-seventh of a pound of the root, that is, 1,000 grains, (this is done to show the specific gravity;) attach it to a very fine wire or silk by a small hook, which is to be attached to a scale-beam such as is used for weighing medicines, (the scales need not be removed,) but have a corresponding piece of wire or silk attached to the other end of the beam so as *exactly* to balance. Then immerse the piece of root which has been attached to the wire in water, so that it hangs free from the sides of the vessel, and is at about the center of the water, and put in the other scale-weights until they just balance the piece of root; you will find that the piece of root, when cut from the *top* of the bulb, will be scarcely heavier

than the water which it displaces, while a piece of the root cut from the lower end of the bulb will require many grains to balance it, and thus show that the lower end of the root is far richer and of greater specific gravity than the upper.

Professor Voelcker, of England, gives the following as the relative specific gravity or weight of the root, and its consequent richness, when the root is divided and tried in different parts or sections. For example, a beet-root, grown in Berkshire, England, being divided into six portions, and analyzed, 1, the top, next the leaves, contained 5½ per cent. of sugar; 2, the next, 7¼ per cent.; 3, the next, 8¾ per cent.; 4, the next, 10½ per cent.; 5, the next, 10¾ per cent.; 6, the next, 11.06 per cent.

In a beet-root from Surrey, England, cut in four divisions: Top, 1st, 6 per cent.; 2d, 8½ per cent.; 3d, 8¾ per cent.; 4th, 9½ per cent. Another turnip-shaped beet contained: Top, 4½ per cent.; bottom, 8.05 per cent.

A great deal has been said and much mystification made about the possibility of growing roots which contain a greater proportion of salts than of sugar. Doubtless there is considerable truth in this; but of one fact we may be certain, and it is a practical fact: "That all beet-roots produced in good old land, which has been manured the previous year, will produce the maximum of sugar which the kind of root will produce; and that the production of salts will not be to a greater extent than is natural and necessary for the perfecting of the root for its present yield of sugar and its future production of seed."

The practical grower of beets may, therefore, banish all these speculative ideas, and proceed on the axiom that "The better the land, (provided it is old land,) and the better it is manured, the more sugar will follow to the acre; whilst on poor, sandy soil, and on mucky or peaty land, although the roots may be large, and the crop per acre heavy, yet he may expect that his yield per acre of sugar will be far less."

A rich clay, a clay loam, or even a rich sandy loam, well fallowed the previous year, and well manured, (also the previous fall,) will also produce the maximum of sugar, and, bearing this fact in mind, no one will be so silly as to sow his beet on any other kind of soil. If he does, he will meet with disappointment.

Of the various kinds of absolutely white beet the "Silesian White" sugar seems to be the best and the hardiest. The root grows almost entirely under the ground, and thus does away with the necessity of earthing up, a process, however, which should always be practiced where possible. In all cases it may be taken as a general rule, that the sugar-bearing roots should be earthed up with the plow or cultivator as often as the roots force themselves considerably above the soil. All the Silesian beets have colored skins above ground.

Any person going into the raising of sugar-beets should get as many kinds as possible; try them all; keep a record of the results, and then cultivate that kind which he finds most suitable to his own farm. In doing this he can never go wrong; every farm varies from others in some respects; no person can be expected to know beforehand the kind that is most suitable for his land, and nothing but actual trial and experience can be perfectly depended on.

Hardiness against the effects of frost is a most important point, and the prudent beet-producer will be especially careful to select those kinds which are least sensible to frost. Actual experience is the only guide to be depended on.

The second great point is the reduction of the root to such a state

that it is easily carried to the centers, where it is to be reduced into sugar.

The richest possible root, as it contains 80 per cent. of water, cannot be profitably carried more than two or three miles, and generally not more than one mile. This has led in France to the establishment of "raperies," where the root is ground and pressed, and the juice is then conveyed to the sugar factory in iron pipes, under ground. The distance the juice is thus conveyed is often seven miles, the juice being first prepared with lime.

In Gallicia, (Europe,) at the great sugar factory of Schuetzenbach, where they employ 3,000 hands, the roots are sliced and dried and the sugar is extracted by diffusion. In this way the root is reduced, weight for weight, to about the value of barley, so that the dried roots can be carried as far as barley; but this plan is destructive to the farm, inasmuch as it leaves only the greens and foliage of the plant as a manure for the soil, and the land is only benefited by the extra cultivation it receives, while all the mineral elements of the root are removed, most certainly to the great detriment of the land. Neither of these plans is adapted for American use in a general system of beet-growing. Here we require the growth of the crop as an amelioration of the soil, and the consumption on the farm of all refuse so as to produce the greatest possible quantity of manure.

To attain this end, the roots must be *reduced on the farm* to pulp, which must be pressed, and the juice so concentrated as to be of easy carriage, and this can only be done in one of two ways: In the first, the juice must be defecated and purified by the usual processes as before described, and then be evaporated into a concentrated shape, so that it will keep for any length of time without injury. In the second, the juice as expressed from the root must be concentrated by evaporation into a coarser product, which contains all the elements of the root except the water and the pulp, (but in which the sugar is not injured,) and is ready to be refined by the refiner at the great centers of the industry.

This second course is by far the easiest, as it requires no chemical skill or special machinery and is not beyond the most ordinary comprehension—but there is this difficulty: The defecated juice, having been deprived of all its impurities, evaporates without being liable to burn in the evaporating vessels, and it is as easily reduced as the juice of the sugar-cane or that of the sorghums or maple sap; but the undefecated juice is peculiarly liable to burn on the bottom of the evaporator, and must therefore be evaporated either by steam-heat or, what is far simpler, by a double pan, the outer pan containing water and the inner pan the juice. The only objection to this course is that the evaporation does not proceed as rapidly in the double as in the single pan. The produce, however, when obtained and sufficiently concentrated, keeps as well as that of the defecated juice, and also refines equally well. The writer has proved this by actual experiment. If carefully done, the concentrated undefecated juice yields as readily to the means of purification as the defecated juice; it only requires one more operation in the hands of the refiner, and although not worth so much to the producer, "weight for weight," gives as profitable yields to the refiner (less the expense of one operation) and produces as pure a sugar.

In either of these plans, however, "speed and cleanliness are everything." If the juice is once allowed to ferment, even in the slightes degree, the production of crystalized sugar is rendered almost impossible, and the yield of it is so far reduced as to prove ruinous both to the producer and refiner. In either case, therefore, the juice must go directly

into the boiler after being expressed, and must be brought to the boiling heat with the least possible delay, more particularly with the undefecated juice, which must never be in any other vessel than the boiler until completed, and must be evaporated with the least possible delay. The necessity of this cannot be too much insisted on.

EDW. L. CULL.

TORONTO, CANADA, *June* 17, 1873.

FACTS FROM VARIOUS SOURCES.

INTERNATIONAL CROP-REPORTS.—The secretary of the Iowa State Agricultural Society, in his annual report for 1872, says, concerning the practicability of international crop reports:

Plans to obtain a true report of the condition of crops throughout the world, for the benefit of farmers, have of late received wide discussion. It is proposed to utilize the appliances and machinery already in the possession of the Department of Agriculture—the storm-signal service, for the benefit of the War Department; the meteorological reports of some of the States, together with the observations in all other lands now made under the direction of the several governments—to accomplish this result. To this end it is recommended that a common plan be adopted, through an international conference of meteorologists and workers, and it will follow that every farmer in the land will be kept as accurately acquainted with the crops, and their possible effects upon the market, as are the bankers and brokers and merchants in London, New York, and Chicago. By the knowledge thus gained they would receive full price for their produce, and no longer be at the mercy of speculators and middle-men. The feasibility of arriving at some plan by which this may be done is argued with great ingenuity by the supporters of a system of international crop reports; and, from the extent and magnitude of the interest involved, it should at once receive careful and candid consideration.

BREAD-EARNING.—As going to show the importance of united action among farmers and mechanics, the Rural World (Saint Louis) appropriately quotes Commodore Maury, whose interest in agricultural matters has long been acknowledged. The quotation is as follows:

According to the census returns of 1870—as far as I can see, and as I can understand—there are in the United States, using round numbers, 12,505,000 bread-earners. These twelve and a half millions subsist nations with the fruits of their labor; they give food, shelter, and raiment to the 39,000,000 of souls that inhabit this country. Thus, you perceive that every bread-earner has, on the average, to fill a little more than three mouths.

Of these bread-earners, 5,922,271 were engaged in agriculture, and 1,765,010 in other rural trades and callings, such as blacksmithing, carpentering, and the like, making, with their food dependents, a total of 23,530,000 souls, in round numbers, out of the 39,000,000.

The manufacturers, including operatives and servants, earn bread for 1,117,000 souls. Commerce, including merchants, shop-keepers, sailors, clerks, peddlers, bar-keepers, &c., earn bread for 2,256,000. Railroad and express men earn bread for 595,000. Miners earn bread for 472,000.

So it comes to this, according to this census: While agriculture and mechanics fill ten times as many mouths as commerce, twenty times as many as manufacturers, forty times as many as railroads, and fifty times as many as mining, yet the least of these, by combination and management—as one of your orators on a former occasion has told you—exercises three times the influence in the country, and thrice the power with the Government, that you do—all for the lack of the proper spirit among farmers to work and pull together.

In connection with this, The World promptly says that the farmers and producers, who should in reality constitute the governing power, must cease to be governed; they must claim their natural rights, and maintain them by means of prompt and efficient organization. Farmers' clubs may serve as a basis for a township organization; these to form

the basis for a county, State, and national one. It is not desirable that such an organization should be political in character. Its whole aim should be to accomplish the greatest good for the greatest number. The time is at hand for the marshaling of the mighty forces that have hitherto been apparently at rest. The worth and value of the producer must be acknowledged. It is time that equitable and just laws be enacted in the interest of farmers and workingmen. The World recommends united and immediate action among those directly concerned.

SILK-CULTURE IN INDIA.—The Agricultural Gazette of India states that of a large number of silk-worms' eggs distributed in the Mysore district, nearly all have failed to germinate, owing to climatic causes. In the Bangalore and Kolar districts the worms were hatched, but nearly all perished. The symptoms attending this malady were remarkably uniform. The worms assumed a reddish color; their heads became enlarged, and a greenish fluid exuded from their mouths.

COTTON-CULTURE IN INDIA.—The experimental culture of cotton is, this year, to be greatly extended in the northeastern province of British India. This crop has become an important one throughout the northern and eastern portions of the Chittagong, including the newly acquired Garo territory. In Assane and along the ranges between that province and Sylhet, cotton is cultivated on a large scale. Seed for experimental culture is to be distributed among the government officers along the frontier. Thus the Anglo-Indian authorities are making energetic efforts to secure a large cotton crop.

WHEAT-AREAS.—The following interesting statement is quoted from the Prairie Farmer, (Chicago:)

Years ago the city of Odessa, situated on a bay of the Euxine, between the Dnieper and the Dniester Rivers, was the greatest shipper of grain in the world. Odessa is the one shipping mart of all Southern Russia, and the growth of its trade represents the growth and development of that large country. But Russia, though large, is slow. She has few railways, no agricultural machinery, and the area of her wheat-fields has not enlarged in anything like the ratio which has marked the growth of farming in the Western States of America. In 1840, when Odessa shipped 170,000 tons of grain, Chicago shipped only 10,000 bushels. In 1850 the shipments of Odessa were 250,000 tons; of Chicago, 3,000,000 bushels. Between 1860 and 1870, Chicago passed the Russian port, and in 1872 the value of grain sold at Chicago for shipment east was $100,000,000, and the transactions of trade larger than those of any other city on the continent but New York. The elevators of Chicago now have a capacity for 13,000,000 bushels at once, and this capacity is rapidly increasing as the wheat area extends to the new lands of Minnesota, Dakota, Nebraska, Iowa, and the far West.

FRUITS IN WASHINGTON TERRITORY.—Mr. Manning, secretary of the Western Washington Industrial Association, states that the chestnuts received from the Department are thriving finely. One tree in the town of Olympia has already attained a height of 30 feet. Butternut, walnut, and almond trees are all growing well, all perfecting their fruit. Ice has been formed over an inch only once in six years. Prunes, apricots, nectarines, quinces, thrive well.

The chestnuts above referred to are of the Spanish variety, and were planted in the experimental gardens of this Department in 1867, and the trees subsequently distributed, beginning in 1868.

PRODUCTS OF DAVIESS COUNTY, KENTUCKY.—Our correspondent makes a very careful statement concerning the leading products of this county. According to the books of the assessor 10,549,240 pounds of tobacco were raised, of which 1,013,100 pounds are credited to negro proprietorship. Of corn, 1,067,700 bushels were raised by whites; by negroes, 63,930 bushels, or a total of 1,131,630 bushels. Of wheat, by whites,

57,322 bushels; by negroes, 995 bushels, or a total of 58,317 bushels. Of hay, by whites, 3,158 tons; by negroes, 16, or a total of 3,174 tons. The total business transactions of the county, through its warehouses, during the year amounted to 13,135,000 pounds. The absolute total grown in the county was 11,417,000 pounds, which, sold at an average of 7½ cents, yielded for the crop $799,190. The discrepancy between the assessor's returns and the actual is, of course, explicable. The amount of whiskey, in gallons, actually returned up to June 1, was 399,487; estimated by the United States collector, to close of the season, 60,513. Total, 460,000.

THE DAIRY.—In one township of De Kalb County, Illinois, Somonauk, there are three large cheese factories whose united product for the season, up to July 15, was 350,000 pounds. Two of these factories made 240,000 pounds last year, the cheese being pronounced most excellent in quality. At this time there are in all ten co-operative factories in the county, one producing butter as well as cheese, and one butter only. Besides, there are in the county several private dairies using, respectively, the milk of from fifty to one hundred cows.

TREE PLANTING IN KANSAS.—Mr. John Hodgins, of Nemaha County, Kansas, writes:

A package of chestnuts, planted in November last, (1872,) are coming up nicely. I have a fine bed of asparagus, raised from seed received from the Department two years ago. I have over 4,000 forest trees, of 30 varieties, and 12 varieties of fruit—all doing well on the high prairie soil.

THE ONION AS FOOD.—It is stated that the onion forms one of the common and universal supports of life in Spain and Portugal. Authority shows that according to analysis the dried onion contains from 25 to 30 per cent. of gluten, and ranks in this respect with the nutritious pea and the grains.

It is not merely as a relish that the wayfaring Spaniard eats his onion with his humble crust of bread, as he sits by the refreshing spring; but it is because experience has long proved that, like the cheese of the English laborer, it helps to sustain his strength also, and adds, beyond what its bulk would suggest, to the amount of nourishment which his simple meal supplies.

SUGAR IN CALIFORNIA.—The following is taken from a recent number of the Pacific Rural Press, (California:)

During the past year 83,000,000 pounds of sugar were imported to the Pacific coast. Of this 65,500,000 pounds were consumed. There was only 1,500,000 pounds of beet sugar manufactured in the State, by the factories of Sacramento and Alvarado, so there is still room for eighty-six such factories, giving employment to 8,600 operatives for seven months of the year—from August until March—not to speak of the Chinese, numbering one hundred, on the Alvarado Company's farm, where they are employed in weeding, hoeing, &c. These Chinese are the only hands at present employed on the Alvarado farm, and are kept to cultivate the young beets.

The San Francisco Bulletin asserts that the prospects of beet culture in the State are exceedingly promising, and with the decline of cane-sugar manufactured in the Southern States, it is not improbable that it will ultimately be the source of supply of a large portion of the sugar consumed in the United States. The venture of the Alvarado Company has proved eminently successful, and the farmers of the locality have discovered that it is possible to raise a very fair crop of beets when wheat from excessive moisture or drought has entirely failed.

IMPORTANCE OF GOOD SEED.—As showing the importance of proper seed selection the experience of a farmer of San Mateo County, California, may be cited. He sowed large, full-grown wheat and small-

grained shriveled seed side by side on similar soil for hay. In the latter part of June he reports that the large grain is at least three inches taller than the other, and is also rank and green, while the other seems to be withering and dying.

STARCH FROM THE BUCKEYE.—A large factory near Paris is making starch exclusively from horse-chestnuts, the yield being fully 16 per cent. With this nut the buckeye is closely allied, the constituents of the fruit being essentially the same. It is proposed, in view of this fact, by progressive Californians, to enter upon the business of rearing buckeye-trees for starch-making purposes.

ALFALFA, (*Medicago sativa.*)—The success of the Department distribution of this clover in the milder climates has been invariable. In name it is interchangeably Alfalfa, Lucerne, and Chilian. An additional importation of seed is expected from Chili during the season, and its distribution, for experimental purposes, will be undertaken in the fall of the present year. The Messrs. Vilmorin, Andrieux & Co., of Paris, France, through whom the supply is purchased by the Department, say:

> Botanically we consider Lucerne and Chilian clover the same variety, but it seems to have a little changed during its cultivation in a more temperate climate and grown less productive, less hardy, and more tender than the old stock—at least with us in France.

In this connection may be quoted an article on the value of Alfalfa and the methods of its cultivation in California, from the Kern County Courier:

> The roots are not of the fibrous and woody nature of the other grasses. Hogs feed upon them with the greatest avidity, and often follow them down to the depth of two feet or more, although this by no means destroys their vitality. It would be an unprofitable grass in any of the Northern or Middle States, and would not be likely to do well anywhere east of the Rocky Mountains unless in the extreme Southern and Gulf States. Its peculiar home seems to be in a warm, dry climate, where the ground never freezes, and frosts rarely, if ever, occur. It does best in a well-drained and friable alluvial soil, with a penetrable subsoil of an argillaceous nature. In this climate it may be mown six times, or oftener, each year, and be depastured during the winter, or for a period of three months. When young it is extremely delicate, and should be sown in connection with barley or wheat. When this is removed it will generally be found to have attained the height of two inches, and thereafter the surface requires to be kept moist by irrigation, as the roots have little penetration, and the young plants would otherwise soon wither on exposure to the sun. The second year it is able to take care of itself, and the fourth it arrives at full bearing. The roots then ramify so widely and reach to such a depth that it is able to bid defiance to drought. It does not begin to fail in productiveness in less than five years. When this occurs it may often be restored to its original vitality by plowing and a thorough pulverizing of the surface; the portion of the roots remaining below the reach of the plow will put forth fresh shoots and the field be soon again carpeted with verdure. When it is desirable to exterminate it altogether, with the view of re-seeding or planting some other crop, it can only be done by flooding the field with water and allowing it to stand for several days.
>
> When this grass is generally cultivated in the warmer climates the northern and more temperate regions of this continent will lose their present reputed superiority in stock-raising. They have hitherto retained it because no species of grass known would retain its vitality during the long hot summers of the semi-tropical and tropical climates. Alfalfa has this desirable peculiarity, joined to more than twice the productiveness of any northern grass.

BLACK-LEG IN CATTLE.—The disease known as the black-leg is prevailing to some extent among the calves in Vernon County, Missouri. A farmer reports that he has lost twenty-six out of eighty head of cattle with a disease in the back or kidneys. They have good use of fore-legs, but no control over their hips, followed by rigidness in the joints. Many suffering from the disease refuse to eat, and all attacked have died.

TEXAS CATTLE.—Writing from Ellsworth County, Kansas, a correspondent says that 140,000 Texas cattle had arrived in that county, and were being grazed on the rich grasses of the country, the buffalo and the mesquite, of which there seems to be almost an inexhaustible supply. Ellsworth City, on the Kansas Pacific Railroad, is a great shipping point for these cattle. No Spanish fever has appeared among the native or Durham stock this season.

SUMMER-PASTURE FOR CATTLE AND SWINE.—Our De Kalb County, Illinois, statistical correspondent calls attention to the fact that a new system of summer pasturage for cattle and swine is being adopted in that county. He says that winter-rye sown reasonably thick furnishes excellent pasturage; swine appear to thrive better upon it than upon timothy and clover. It retains remarkable freshness in a very dry season, even when ordinary pasturage is scanty. In connection with it little if any corn is necessary to keep hogs in desirable thrift.

RED CLOVER.—Writing from Saint Joseph, Missouri, Messrs. H. M. and A. H. Varies say, concerning red clover seed received from the Department, that it was sown upon ground of ordinary fertility in the latter part of March or beginning of April. Every seed seemed to grow. The clover bloomed almost as soon as that grown in fields of several years' standing It grew large enough the first season to have yielded nearly a half crop of hay, and passed through the last severe winter unhurt, and in a luxuriant and healthy manner. It seems to be hardier than the ordinary red clover of that section, though in appearance very similar.

FULTZ WHEAT IN MARYLAND.—The wheat crop of Frederick County, Maryland, promises an abundant yield. The leading wheat grown in the county, Tappahannock, will average three and four grains to the side. The Lancaster (red) promises well, but will not yield as much, per acre, as Tappahannock. It is thought that the average yield in that district will be from eighteen to twenty-five bushels per acre. A correspondent, to whom was sent a quantity of Fultz wheat for distribution, says that it is beyond doubt the most promising variety in the county, admirably adapted to the climate. At the date of harvesting (June 30) he is satisfied that he can pick out acres of it that will yield 35 to 45 bushels, and is confident that it will average 30 bushels per acre. Commercial fertilizers are generally resorted to in the wheat-culture of the county.

SHEEP *vs.* DOGS.—Another plea in behalf of sheep, as against much worse than worthless canines, comes from Knox County, Tennessee. Out of a flock of thirty-four, a farmer has lost twelve, having left only four ram-lambs for sale. To replace this loss with imported stock, he asserts, would cost him upward of $1,000. His flock was the principal means of making money for the support of himself and family. His statement in detail is an interesting one, and worth the consideration of legislators and the tolerators of dogs in the sheep-growing regions:

I would here say that I came to Tennessee through the strong recommendation of American emigration agents. I was assured that I should be protected both in person and property, and here I am, with a family of twelve children and my property, four thousand miles away from my native land—the property, which was my chief dependence, for a time, for the support of my family, swept away at a stroke by a set of brutes which are of no earthly use to any one. I am told I have my redress in the courts of justice. I have very little hope of obtaining that justice which the case demands, when, as one gentleman at the recent farmers' convention said, the members of the State parliament were afraid to offend their constituents by passing a law to prevent the depredations of such brutes—a pitiable state of things, truly, when public

men can be scared by a dog. I think, under the circumstances, it is the duty of the State government to see my loss made up; if not, then I hope to see no more in the public press inviting emigration from Great Britain.

The writer manifests a very excusable warmth in the above utterance.

RENO COUNTY, KANSAS.—Two years ago there was only one settler in Reno County, Kansas. Now Government lands within its limits, with very rare exceptions, are occupied by actual settlers. The population of the county is between eight and nine thousand.

PUTNAM COUNTY, MISSOURI.—Greater attention is being given than formerly in this county to the judicious use of agricultural machinery. Such a policy will shortly bear its fruits in an increased production of staple crops.

SHEEP DISEASE IN NEW MEXICO.—Our correspondent in Santa Fé County, New Mexico, sends us the following:

I would like to call the attention of the Department to a disease among lambs, reported to me by Mr. E. W. Eaton, one of my assistant correspondents.

Mr. Eaton says: "I would like to call your attention to a disease that destroyed about six hundred of my lambs, and in the same proportion, say two-thirds of all the lambs dropped in several other cases, and, if possible, get some information from the Department of its cause and cure. It is in the mouth and on the lips, having the appearance of syphilitic warts in the mouth, and growing to entirely cover the teeth. So far, I could see it did not affect the tongue, the lips growing to three or four times their natural size. I used spirits of turpentine; this seemed to partially check the disease for a time, but did not entirely cure.

PENNSYLVANIA YELLOW CORN.—Our correspondent in Twiggs County, Georgia, reports:

The Pennsylvania yellow corn received from the Department was planted in March, manured with cotton seed. While my other corn planted a week earlier is just tasseling, that is made. I planted Adam's early sweet corn, three varieties—sugar, flint, and Cooley—the yellow is far superior to either.

PRODUCTIVE MILLET. — Our correspondent in Limestone County, Texas, reports that a variety of white millet, known in that locality as "White German millet," has been tried on high loamy land in the northern part of the county, and promises to be a very valuable acquisition. The heads are large and full of seed, and it produces at the rate of 2 to 2½ tons per acre, hay, which is highly relished, and all consumed by stock. He thinks it a better crop than Hungarian grass.

IMPORTED SHEEP.—Mr. William Gilson, our correspondent for Mercer County, Pennsylvania, reports that he has recently imported from England 26 "Gladstone" sheep. The heaviest weighed 410½ pounds, and clipped 15¼ pounds of wool. The weight of one yearling was 264 pounds, and of its fleece, 15½ pounds. The 26 yielded an average of 15 pounds and 5½ ounces of clean washed wool per head.

AGRICULTURAL PROGRESS IN THE SOUTH.—Our correspondent in Hinds County, Mississippi, reports:

The crops were planted this year under more favorable circumstances than usual. The land was in better condition, the teams in better order, and laborers entered more into the spirit of farming than at any time since the war. This is owing in part to the good price paid for last year's cotton crop. The freedmen are becoming ambitious to own property, and are working well as a general thing.

Our correspondent in Beaufort County, North Carolina, writes as follows:

There has been a decided improvement in the farming interest in this county in the last four or five years. More intelligence and skill are now engaged in the business;

better tools and machinery are used, and a greater variety of crops are grown; in fact, there is a general improvement. The greatest drawback is that cotton still occupies more than its proper share of attention.

AGRICULTURAL ADVANCE IN IOWA.—A correspondent in Union County reports a growing interest in that county in the culture of flax, fruit, Alsike clover, and hedges. Between 1,000 and 2,000 acres have been put under flax this spring, and an unusually large number of fruit-trees have been set out—some farmers starting orchards with as many as five hundred. Alsike clover is meeting with success, both because of its adaptation to the climate and because it proves to be a good substitute for buckwheat as a source of honey for bees. For the planting of hedges there is now a general "rage." This results, in part, from the increasing scarcity of timber. The osage orange is principally planted, but some prefer willow. Last season hedges were started by setting out plants, but this season the prevailing practice has been to sow the seed in the place for the hedge. For osage orange hedges the "double-row system" is gaining in popular favor.

DISCOURAGEMENTS TO FARMERS IN ARKANSAS.—A correspondent in Franklin County, Arkansas, under date of May 22, reported that in that section, and he thought throughout the State, the farmers had a somewhat cheerless prospect before them. Food for both man and beast was very scarce; the season had been unusually wet and backward, and, as a consequence, both corn and cotton were late and small, and there were strong indications that these crops must be short in quantity and poor in quality. He concludes as follows:

> More oats have been sown this year than ever before, and, as far as my observation extends, they look promising. Some interest is being manifested in Hungarian grass, but the entire absence of mowers, and hay rakes and forks prevents a great many from raising it. It does finely on our river-bottoms, and three tons to the acre can be easily raised. The hogs have died off so within the last few years that we have to depend upon the counties bordering on Missouri for our main supply of meat. Large quantities of meal are also hauled from there, in wagons, and meet with a ready sale at $1, cash, per bushel, by the load. It is generally conceded that the farmers in this section are worse off than they were the first year after the war.

SUPERIOR VALUE OF THOROUGHBRED STOCK.—Very many farmers who rely in part for their profits on the horned cattle they keep continue to grow only the unimproved, inferior varieties which have descended to them from the random stock kept by their forefathers. The following analysis of the reported results of two auction sales in Illinois of short-horn stock may suggest to such farmers the wisdom of exchanging their scrubby cattle for improved breeds. The first of the sales referred to was of short-horn cattle owned by J. H. Spears & Sons, of Forest Hill, near Tallula, Menard County. The sixty head sold were all purchased by the Messrs. Spears in Kentucky last autumn most of them from the herd of William Warfield, of Lexington. Twenty-six were bulls, and the remainder were cows. The latter sold as follows: 1 calf, $100; 9 yearlings, average $307.83 per head; 9 two-year-olds, average $448.33; 1 three years old, $230; another with a bull-calf beside it, $1,510; 3 four-year-olds, average $256.67; 1 five years old, $340; 1 six years old, $250; 1 seven years old, $795; 2 eight years old, $175 and $225; 1 eleven years old, and calf beside it, $295; 2 twelve years old, one $150, and the other with twin calves, $500; 2, the ages not given, $225 and $260. Total, $11,630.50. The twenty-six bulls sold as follows: 1 calf, $105; 16 yearlings, average $274.06; 7 two-year-olds, $233.57; 1 three years old, $330; 1 four years old, $210. Total, $665. Total for the herd, $18,295.50. Average per head,

$304.92. The next day, June 12, at Springfield, Edward Iles sold at auction from his herd thirty-seven head. Eight were bulls, and sold as follows: Cherub, three years old, imported from England, $6,000; sired by him, 1 calf, $150; 1 yearling, $525; another, $1,300; 3 yearlings, (not of Cherub's stock,) average $135; and 1 two years old, $185. The twenty-nine cows and heifers brought: 1 calf, $525; 5 yearlings, average $771; 10 two-year-olds, average $763.50, the extremes being $185 and $1,125; 4 three-year-olds, average $1,037.50, extremes $625 and $1,650; 2 four-year-olds, $755 and $1,700; 4 five-year-olds, average $1,546.25, extremes $650 and $2,500; 2 nine-year-olds, $310 and $500; 1 ten-year-old, $625; average price per head for the 29, $904.82; for the 37, $940.70. The average price per head of the 35 yearlings sold at the two auctions was $378.30; of the 27 two-year-olds, $499.63.

FLAX-CULTURE.—This branch of farming is on the increase in the Northwest. About 4,000 acres were this season sown in Marshall County, Iowa. In Watonwan County, Minnesota, where last year 1,000 acres were sown, the acreage has been enlarged to 7,000. Flax is also raised in Nicollet County, Minnesota, farmers generally receiving about $12 per ton and realizing a fair profit. It does well upon the highlands overlooking the Clackamas River, Oregon. Very few lint mills are to be found in these new flax growing regions, where the crop is grown mostly for seed. The lint is therefore only a waste product. It would be well if some manufacturing enterprise should be aroused and a new margin of profit secured to the farmer by utilizing this material. In Washington County, Nebraska, flax culture is also increasing rapidly. The results last year were very satisfactory, averaging 14½ bushels per acre, worth $1.20 per bushel.

RECLAMATION OF SWAMP LANDS.—A company of enterprising farmers in Holt County, Missouri, are constructing a ditch twelve miles long, by which an immense tract of overflowed and swamp land will be effectually reclaimed.

PROGRESS IN NEBRASKA.—An Adams County, Nebraska, correspondent says:

> This county, two years ago, was an unbroken prairie; now there are very few portions of it not taken up and improved. In all respects it is an excellent agricultural region.

PROGRESS IN EGYPT.—As one of the signs of progress in agricultural industry in Egypt, it may be of interest to our people to know that His Excellency Chérif Pacha, minister of foreign affairs, has recently made an order in behalf of the government on R. Habersham, Son & Co., Savannah, Georgia, through R. Beardsley, esq., consul-general of the United States at Alexandria, Egypt, for fifteen tons of sea-island cotton seed, for culture in Egypt, under the express direction of the enterprising ruler of that country, Ismail Pacha.

HART COUNTY, GEORGIA.—The statistics of Hart County, Georgia, for the past year, are furnished as follows:

Number of acres in cotton	9,293
Number of acres in wheat	4,288
Number of acres in rye	22
Number of acres in barley	1
Number of acres in oats	4,202
Number of acres in Indian corn	12,762
Number of acres in sweet potatoes	229
Number of acres in Irish potatoes	44

Number of acres in tobacco	3
Number of acres in sorghum	47
Number of acres in clover and seeds	4
Number of acres in vineyards	2
Number of acres in orchards	584
Number of sheep	3,507
Number of dogs	922
Number of hogs	4,387
Number of horses and mules	1,213
Number of cattle	4,495
Number of cotton factories	1
Number of spindles	552
Number of carding-machines	2

MARKET-PRICES OF FARM-PRODUCTS.

JULY, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.

Articles.	Price.	Articles.	Price.
NEW YORK.		**BOSTON.**	
Flour, superfine State...per bbl.	$4 70 to $5 10	Flour, western, superfine..per bbl.	$5 00 to $5 50
extra State.....do...	6 05 to 7 00	western extras.....do...	6 25 to 7 50
superfine western...do...	4 70 to 5 10	western choice.....do...	8 00 to 11 00
extra to choice western, per barrel.....	5 70 to 10 50	southern extras.....do...	8 00 to — —
southern shipping, common to choice..per bbl.	6 00 to 7 75	choice Baltimore....do...	11 00 to — —
southern family, ordinary to choice.....per bbl.	7 75 to 10 45	Wheat.....per bush.	— — to — —
Wheat, No. 1 spring...per bush.	1 52 to 1 55	Rye.....do...	85 to 90
No. 2 spring.....do...	1 42 to 1 55	Barley.....do...	— — to — —
winter, red, west'n..do...	1 50 to 1 60	Oats.....do...	42 to 53
winter, amber, western, per bushel.....	1 60 to 1 65	Corn, southern yellow.....do...	60 to 62
winter, white, western, per bushel.....	1 60 to 1 85	western yellow.....do...	60 to 62
Rye.....per bush.	81 to 85	Hay, eastern and northern, per ton.....	18 00 to 29 00
Barley.....do...	Nominal.	Beef, western mess.....per bbl.	10 50 to 12 50
Corn.....do...	45 to 68	western extra.....do...	12 50 to 13 50
Oats.....do...	43½ to 46	Pork, prime.....do...	13 75 to 14 25
Hay, first quality.....per ton.	28 00 to 30 00	mess.....do...	16 50 to 17 00
second quality.....do...	23 00 to 25 00	Lard.....per lb.	8½ to 9¼
Pork, mess.....per bbl.	16 20 to — —	Butter, N.Y. and Vt., fair to choice, per pound.....	22 to 27
extra prime.....do...	13 50 to 13 75	Butter, western.....per lb.	20 to 25
prime mess.....do...	15 62½ to 16 12½	Cheese, N. Y. and Vt. factory, choice, per pound.....	12½ to 13
Lard.....per lb	8 13/16 to — —	Western factory, choice, per pound.....	12 to 12½
Beef, plain mess.....per barrel.	9 00 to 11 50	Cotton, ordinary to good ordinary.....per lb.	13 to 18
extra mess.....do...	11 25 to 12 50	low middling to middling.....per lb.	19½ to 20
Butter, western.....per lb.	15 to 23	Sugar, fair to good refining..do...	7⅞ to 7⅞
State dairy.....do...	23 to 28½	Tobacco, lugs.....do...	— — to — —
Cheese, western, factory....do...	9 to 10	common to medium leaf.....per lb.	— — to — —
State factory.....do...	12 to 12½	Wool, Ohio and Pa.....do...	— — to — —
Cotton, ordinary to good ordinary.....per lb.	14½ to 18	Michigan.....do...	— — to — —
low middling to good middling.....per lb.	20 to 23	other western.....do...	— — to — —
Sugar, soft yellow.....do...	8½ to 9½	pulled.....do...	— — to — —
soft white.....do...	9½ to 10⅛	combing fleece.....do...	— — to — —
Tobacco, Western lugs, all grades, per pound.....	7 to 8½	California.....do...	— — to — —
common to medium leaf, all grades per lb	8½ to 10½	Texas.....do...	— — to — —
Wool, American Saxony, fleece, per pound.....	50 to 53	**PHILADELPHIA.**	
American merino, full blood.....per lb...	48 to 50	Flour, superfine.....per bbl.	4 00 to 4 25
American, combing..do...	50 to 55	Pa. extra.....do...	4 75 to 5 00
California spring clip, unwashed.....per lb.	21 to 31	Pa. family.....do...	7 00 to 8 00
California fall clip, unwashed.....per lb.	17 to 22	western family.....do...	6 25 to 7 00
Texas.....do...	18½ to 33	western, fancy.....do...	7 50 to 8 12½
		Wheat, winter red, western, per bushel.....	1 55 to 1 60
		winter, amber, western, per bushel.....	1 59 to 1 65

Market prices of farm-products—Continued.

Articles.	Price.		
PHILADELPHIA—Continued.			
Wheat, winter, white, western, per bushel	$1 60	to	$1 72½
spring, per bush	1 35	to	1 52
Rye, do	63	to	65
Barley, do	Nominal.		
Oats, western, white, do	42	to	47
western, mixed, do	39	to	43
Corn, yellow, do	52	to	56
Hay, fresh, baled, per ton	25 00	to	28 00
common to fair shipping, per ton	20 00	to	25 00
Pork, mess, per bbl	17 00	to	17 50
prime, mess, do	16 00	to	16 50
prime, do	14 50	to	— —
Beef, western mess, do	8 00	to	10 00
extra mess, do	10 00	to	12 00
Warthman's, city family, do	15 00	to	— —
Lard, per lb	8¾	to	11½
Butter, choice, do	26	to	28
good, do	18	to	24
Cheese, N. Y. factory, do	13	to	14
Ohio factory, do	12	to	13
Cotton, ordinary to good ordinary, per lb	14½	to	18
low middling to good middling, per lb	19	to	23
Sugar, fair to good refining, do	7⅜	to	8
Wool, Ohio X and XX, do	47	to	52
Ohio combing, do	56½	to	63
Indiana tub, do	50	to	— —
pulled, do	40	to	41
unwashed, do	26	to	45
BALTIMORE.			
Flour, superfine, per bbl	4 50	to	8 50
extras, do	5 50	to	9 25
family and fancy, do	7 50	to	11 00
Wheat, white, fair to choice, per bushel	1 60	to	1 80
amber, choice, per bush	1 70	to	1 75
red, common to prime, per bushel	1 40	to	1 70
Wheat, red, western, per bush	1 30	to	1 60
Rye, common to prime, do	70	to	77
Corn, yellow southern, do	60	to	— —
white southern, do	76	to	77
mixed western, do	60	to	60½
Hay, western, good, per ton	18 00	to	24 00
Pork, mess, per bbl	17 00	to	17 50
Beef, Baltimore mess, do	15 00	to	20 00
extra, do	23 00	to	25 00
Butter, western, per lb	14	to	22
Cheese, eastern cutting, per lb	15	to	15½
western cutting, do	12½	to	13½
Cotton, ordinary to good ordinary, per lb	14⅜	to	17⅜
low middling to middling, per lb	19	to	20⅜
Sugar, New Orleans, per lb	8	to	9½
Tobacco, common to good lugs, per cental	7 00	to	8 00
common to medium leaf, per cental	8 00	to	9 50
Wool, fleece-washed, common to fine, per lb	45	to	50
tub-washed, do	55	to	60
unwashed, do	35	to	38
pulled, do	35	to	40
CINCINNATI.			
Flour, superfine, per bbl	5 00	to	5 25
extra, do	6 00	to	6 35
family and fancy, do	6 50	to	8 25
Wheat, red winter, No. 1, per bushel	— —	to	1 35
red winter, No. 2, per bushel	1 30	to	1 32
hill, per bush	1 35	to	1 40

Articles.	Price.		
CINCINNATI—Continued.			
Wheat, white winter, do	$1 45	to	$1 50
Rye, do	65	to	68
Barley, do	80	to	1 20
Corn, do	44	to	50
Oats, do	30	to	41
Hay, baled, No. 1, per ton	17 00	to	18 00
lower grades, do	10 00	to	16 00
Beef, plate, per bbl	12 00	to	12 50
Pork, mess, do	15 25	to	16 00
Lard, per lb	7⅜	to	8½
Butter, choice West'n Res., do	15	to	22
Central Ohio, do	17	to	18
Cheese, factory, do	11	to	— —
pine-apple, do	— —	to	— —
Cotton, ordinary to good ordinary, per lb	13	to	16
low middling to good middling, per lb	18	to	20½
Sugar, N. O., common to fair, do	8¾	to	9¼
N. O., good to prime, do	9¾	to	10
Tobacco, lugs, all grades, do	6	to	22
leaf, do	8	to	35
Wool, fleece-washed, common to fine, per lb	35	to	40
tub-washed, do	40	to	43
unwashed, clothing, do	25	to	27
unwashed, combing, do	35	to	37
pulled, do	33	to	35
CHICAGO.			
Flour, white winter extras, fair to choice, per bbl	7 50	to	10 00
red winter extras, do	7 00	to	8 00
good to choice spring extras, per bbl	6 00	to	6 50
spring superfines, do	2 50	to	4 50
good to fancy Minnesota, per barrel	6 00	to	7 50
Wheat, No. 1 spring, per bush	1 23	to	— —
No. 2 spring, do	1 15⅞	to	1 16¾
Wheat, No. 3 spring, per bush	1 06	to	1 07
Rye, No. 2, do	57	to	63
Barley, No. 2, do	48	to	52
Corn, No. 2, do	33¾	to	34¾
Oats, No 2, do	29	to	30
Hay, timothy, per ton	13 00	to	15 00
prairie, do	9 00	to	11 00
Pork, mess, per bbl	14 00	to	14 25
Beef, mess, do	8 75	to	9 00
extra mess, do	9 75	to	10 00
Lard, per cental	8 10	to	8 50
Butter, strictly ch'ce yellow, p. lb	18	to	20
medium to good, do	15	to	16
Cheese, N. Y. factory, per lb	11	to	12
Ohio and western factory, per lb	9	to	10½
Sugar, N.O., common to fair, do	7½	to	9
N.O., prime to choice, do	9¼	to	9¾
Wool, tub-washed, do	40	to	46
fleece-washed, do	38	to	43
unwashed, do	25	to	26
pulled, do	38	to	44
SAINT LOUIS.			
Flour, winter superfine, per bbl	3 00	to	4 95
winter extra, do	5 00	to	7 00
winter choice and family, per barrel	7 25	to	9 00
Wheat, red winter, No. 1 per bush	— —	to	— —
red winter, No. 2, do	1 67½	to	— —
spring, No. 2, do	— —	to	— —
Rye, do	35	to	52
Barley, do	No market.		
Corn, do	41	to	47
Oats, do	28	to	38
Hay, prime to choice timothy, per ton	16 00	to	20 00

Market prices of farm-products—Continued.

Articles.	Price.	Articles.	Price.
SAINT LOUIS—Continued.		NEW ORLEANS—Continued.	
Pork, mess ..... per bbl.	$15 00 to $15 75	Cotton, low middling to good middling ..... per lb.	$0 17⅞ to $0 19¼
Beef, mess ..... do ..	14 00 to — —	Tobacco, lugs ..... do...	7¼ to 9
Lard ..... per lb.	7 to 8¼	low leaf ..... do...	9 to 10
Butter, choice dairy ..... do...	18 to 20	medium leaf ..... do...	10¼ to 11
prime straight yellow, per pound	14 to 16	Wool, clear bale ..... do...	25 to 26
Cheese, choice factory ... per lb..	15 to 15¼	Louisiana, clear ..... do...	20 to — —
Cotton, middling ..... do...	— — to — —	Sugar, fair ..... do...	8¼ to 9
Wool, tub-washed ..... do...	35 to 47	prime ..... do...	9½ to — —
unwashed ..... do...	22 to 28½	SAN FRANCISCO.	
mixed combing ..... do...	29 to 31	Flour, superfine ..... per bbl.	— — to — —
NEW ORLEANS.		extra ..... do...	— — to — —
Flour, superfine ..... per bbl.	5 00 to — —	higher grades ..... do...	— — to — —
extras ..... do...	5 25 to 6 90	Wheat, State ..... per cental.	— — to — —
choice ..... do...	7 50 to 9 50	Oregon ..... do...	— — to — —
Corn, white ..... per bush.	59 to 60	Barley ..... do...	— — to — —
mixed ..... do...	56 to 57	Oats ..... do...	— — to — —
Oats ..... do...	40½ to 42	Corn, white ..... do...	— — to — —
Hay, choice ..... per ton.	25 00 to 26 00	yellow ..... do...	— — to — —
prime ..... do...	22 00 to 24 00	Hay, State ..... per ton.	— — to — —
Pork, mess ..... per bbl.	16 75 to 17 00	Pork, mess. ..... per bbl.	— — to — —
Beef, Texas ..... do...	11 00 to — —	prime mess ..... do...	— — to — —
northwestern and western, per barrel	14 00 to 15 00	Beef, mess ..... do...	— — to — —
Lard ..... per lb.	8½ to 10	Lard ..... per lb.	— — to — —
Butter, choice western ..... do...	23 to — —	Butter, overland ..... do...	— — to — —
choice Goshen ..... do...	32 to — —	California ..... do...	— — to — —
Cheese, choice western factory, per pound	17 00 to — —	Oregon ..... do...	— — to — —
N. Y. cream ..... per lb.	17 00 to — —	Cheese ..... do...	— — to — —
Cotton, ordinary to good ordinary ..... per lb..	12½ to 16⅞	Wool, native ..... do...	— — to — —
		Californian ..... do...	— — to — —
		Oregon ..... do...	— — to — —

LIVE-STOCK MARKETS.

NEW YORK.		BOSTON—Continued.	
Cattle, extra choice native steers, per cental	$13 00 to $13 50	Sheep, in lots ..... do....	$3 00 to $4 00
lower grades, dressing 55 to 58 pounds per cwt., per cental	9 00 to 12 50	extra ..... do....	4 50 to 6 50
Texans, dressing 55 to 56 pounds per cwt., per cental	8 50 to 11 00	spring lambs ... per cental.	9 00 to 10 00
milch cows ..... per head.	35 00 to 70 00	Western fat swine, per cental	5 75 to 6 00
calves, fair to prime, milk-fed ..... per cental.	8 00 to 10 00	PHILADELPHIA.	
common to ordinary, per cental	6 00 to 7 50	Cattle, fair to choice beeves, per cental	5 75 to 7 75
Sheep, lambs averaging 56 pounds each ..... per cental.	9 50 to 11 00	common ..... per cental.	4 50 to 5 50
Ohio sheep averaging from 75 to 91 pounds each, per cental	4 50 to 6 00	Sheep, fair to good ..... do....	4 50 to 5 50
Hogs, good corn-fed ... per cental.	5 25 to — —	common ..... do....	2 00 to 3 00
BOSTON.		Hogs, corn-fed ..... do....	7 25 to 7 50
Cattle, choice beeves .. per cental.	7 25 to — —	BALTIMORE.	
extra ..... do....	7 00 to 7 12½	Cattle, best beeves .... per cental.	5 75 to 7 00
first quality ..... do....	6 00 to 6 75	first quality ..... do....	5 25 to 5 75
second quality ..... do....	5 50 to 6 00	medium or good fair quality per cental	4 50 to 5 25
third quality ..... do....	4 75 to 5 00	ordinary thin steers, oxen or cows ..... per cental.	4 00 to 4 50
working-oxen ... per pair.	100 00 to 275 00	general average of market, per cental	5 50
milch cows with calves, per head	35 00 to 60 00	Sheep, fair to good .... per cental.	4 50 to 5 50
extra ..... per head.	65 00 to 90 00	good to extra ..... do....	5 00 to 5 50
farrow cows ..... do....	15 00 to 40 00	lambs ..... per head.	2 00 to 4 00
yearlings ..... do....	10 00 to 18 00	Hogs, corn-fed, net .... per cental.	6 00 to 6 50
veal calves ..... do....	3 00 to 10 00	CINCINNATI.	
		Cattle, shipping ..... per cental.	5 00 to 5 75
		prime butchers ..... do....	4 75 to 5 00

Live-stock markets—Continued.

Articles.	Price.	Articles.	Price.
CINCINNATI—Continued.		SAINT LOUIS—Continued.	
Cattle, fair to good butchers', per cental	$3 50 to $4 50	Cattle, light uneven stock steers, 500 to 850 pounds, per cental	$2 75 to $2 25
Sheep, common to prime, per cental	2 50 to 4 75	good Texans and Cherokees, corn-fattened, per cental	4 00 to 4 50
lambs, per cental	4 00 to 6 00	superior to common Texans, per cental	1 50 to 2 50
Hogs, extreme range of light and heavy averages, per cental	4 40 to 4 65	veal calves, common to choice, per head	8 00 to 10 00
CHICAGO.		cows with calves, do	25 00 to 50 00
Cattle, extra graded steers, 1,400 pounds and upward, per cental	5 85 to 6 10	Sheep, per cental	2 62½ to — —
choice beeves, fine, fat, well formed steers, 3 to 5 years old, 1,250 pounds and upward, per cental	5 60 to 5 75	Hogs, extra grades, gross, per cental	4 20 to 4 25
good beeves, well fattened, finely formed steers, 1,150 to 1,250 pounds, per cental	5 25 to 5 35	fair, gross, per cental	4 10 to 4 15
medium grades, steers in fair flesh, 1,050 to 1,200 pounds, per cental	4 80 to 5 15	common to medium, gross, per cental	3 90 to 3 95
butchers' stocks, common to fair steers and good to extra cows, 800 to 1,100 pounds, per cental	3 50 to 4 75	Horses, good driving animals, per head	100 00 to 175 00
common cattle in decent flesh, 700 to 1,050 pounds, per cental	3 50 to 4 50	extra driving animals, per head	225 00 to — —
Texans, north-wintered, per cental	3 50 to 4 75	common to fair animals, per head	85 00 to 110 00
Texans, through droves, per cental	2 25 to 3 25	extra, per head	140 00 to — —
Sheep, per cental	3 00 to 4 75	heavy draught-horses, per head	120 00 to 175 00
Hogs, good to choice, do	4 45 to 4 60	Mules, good heavy animals, per head	125 00 to 165 00
poor to medium, do	4 20 to 4 40	extra, per head	200 00 to — —
SAINT LOUIS.		15½ to 16 hands high, per head	120 00 to 150 00
Cattle, choice native steers, 1,300 to 1,600 pounds, per cental	5 50 to 5 75	extra, per head	175 00 to — —
prime second-class natives, 1,150 to 1,400 pounds, per cental	4 75 to 5 00	NEW ORLEANS.	
good third-grade natives, 1,050 to 1,300 pounds, per cental	4 00 to 4 50	Cattle, Texas beeves, corn-fed second quality, per head	40 00 to 50 00
fair butchers' steers, 1,000 to 1,200 pounds, per cental	4 25 to 4 50	Texas beeves, choice, per head	50 00 to — —
		Texas beeves, first quality, per head	35 00 to 45 00
		Texas beeves, second quality, per head	20 00 to 28 00
		Western beeves, per cental	10 00 to 12 00
		Milch cows, per head	35 00 to 50 00
		Milch cows, choice, per head	80 00 to 100 00
		calves, per head	7 00 to 10 00
		Hogs, gross, per cental	6 00 to 7 00
		Sheep, first quality, per head	4 00 to 5 00
		second quality, do	3 00 to 4 05

FOREIGN MARKETS.

WHEAT.—The conditions of wheat-growth during May were nowhere remarkably encouraging. April had been very cold, while in Northern Germany the temperature was disastrous to vegetation. It did some damage to wheat in Holland and Belgium. Injuries were also reported in France and Spain, but subsequent information showed these reports to be both exaggerated and premature. May-day in England brought a more genial temperature, but the rain-fall in many localities was seriously injurious to vegetation. May exhibited a remarkable variation of temperature; the unseasonable cold of the middle caused the fires to be rekindled upon the hearth; the weather, however, greatly improved toward the close. The cutting winds on the first of June turned some French fields yellow, while in Hungary the injuries were so serious that large growers turned speculators, and bought freely for future delivery. The month closed with favorable prospects in Spain and Algeria. On

the continent generally, however, the inequalities of the season injured the wheat prospects.

In England the unpropitious fall-sowing season had caused farmers to reserve at least 500,000 acres destined to wheat for spring crops The long continuance of wet weather also caused much of the seed sown to rot, while much of the crop that came up was feeble. The weekly deliveries, about May 1, were 11,400 quarters less than at the same time last year, yet the exhaustion of farmers' stocks had become apparent. An equable growing season was necessary to preserve the imperfect promise left. The consequence was an upward tendency of prices more marked than at any previous period. The injuries to the German crop had created a temporary export of cheaper English wheats to Hamburg, which still further depleted the native stock. During the second week in May the local deliveries in England increased 4,000 quarters, but fell, the following week, 2,713, or 8,288, short of the corresponding week of 1872. The opening of the New York canals depressed prices, but the reports of deficient rain-fall in California tended to stiffen them up. Australia also showed signs of a diminished export. English stocks had diminished to one-third of their maximum, while a demand for floating cargoes was developed on the continent. All these circumstances, with a growing crop three weeks behind, tended to elevate prices.

The imports of foreign wheat into the United Kingdom during each of the five weeks ending in May were as follows: May 3, 516,155 cwts.; May 10, 601,574 cwts.; May 17, 568,409 cwts.; May 24, 246,066 cwts.; May 31, 1,130,321 cwts.; total, 3,062,535 cwts. The London average prices during these weeks were as follows: May 3, 55*s.* 9*d.* per quarter on 4,427 quarters; May 10, 53*s.* 3*d.* on 5,324 quarters; May 17, 54*s.* 5*d.* on 4,344 quarters; May 24, 55*s.* 3*d.* on 4,987 quarters; May 31, 54*s.* 10*d.* on 1,720 quarters.

The Mark Lane (London) prices per quarter of wheat during May were as follows: English wheats—Essex and Kent, old white 58*s.* to 68*s.*; do. new white, 50*s.* to 56*s.*; do. new fine, 65*s.* to 67*s.*; do. old red, 59*s.* to 64*s.*; do. new red, 50*s.* to 56*s.*; do. new red, fine, 62*s.* to 64*s.* Norfolk, Lincolnshire, and Yorkshire, 56*s.* to 63*s.* Foreign wheats—Dantzic, 60*s.* to 66*s.*; Extra do., 68*s.* to 72*s.*; Konigsberg, 60*s.* to 65*s.*; do. extra, 64*s.* to 70*s.*; Rostock, 60*s.* to 64*s.*; Siberian red, 57*s.* to 62*s.*; do. white, 63*s.* to 67*s.*; Pomerania, Mecklenberg, and Uckermarck, 59*s.* to 64*s.*; Russian, hard, 47*s.* to 53*s.*; Saint Petersburg and Riga, 55*s.* to 62*s.*; Danish and Holstein, red, 58*s.* to 62*s.*; American, 57*s.* to 61*s.*; Chilian, white, 60*s.*; California, 61*s.*; Australian, 62*s.* to 64*s.*

The Liverpool prices per cental were as follows: American white winter, 13*s.* to 14*s.*; do. red winter and southern, 12*s.* to 12*s.* 9*d.*; do. spring No. 1, 12*s.* to 12*s.* 8*d.*; do. spring No. 2, 11*s.* 9*d.* to 12*s.* 3*d.*; Canadian white, 12*s.* 6*d.* to 13*s.*; do. red, 12*s.* to 12*s.* 8*d.*; California white, 11*s.* 10*d.* to 12*s.* 10*d.*; Chilian white, 11*s.* 9*d.* to 12*s.* 3*d.*; French white, 12*s.* 6*d.*; do. red, 11*s.* 7*d.* to 12*s.* 1*d.*; Spanish white, 12*s.* to 12*s.* 2*d.*; Danubian, 7*s.* 9*d.*; Ghirka, 10*s.* 4*d.* to 11*s.*; Egyptian, 8*s.* 9*d.* to 11*s.* 6d.

The Paris prices per quarter were as follows: Best white, 65*s.* to 67*s.*; best red, 62*s.* to 64*s.* 6*d.*; California, 60*s.* 3*d.* to 63*s.*; Chili, 60*s.* 3*d.* to 62*s.*

Flour.—The imports of flour into the United Kingdom during the five weeks ending May 31, amounted to 518,214 cwts. The native flour was generally in good supply, and its best brands maintained their prices during the month. Foreign arrivals became more extensive as the month advanced. English flour, in Mark Lane, per 280 pounds, brought the following prices; Best town households, 47*s.* to 54*s.*; best

county households, 43*s.* to 46*s.*; Norfolk and Suffolk, 36*s.* to 41*s.*; American, (per barrel,) 26*s.* to 29*s.*; extra, 30*s.* to 31*s.*

In Liverpool, per 280 pounds, English and Irish superfines brought 40*s.* to 42*s.*; extra do., 43*s.* to 51*s.*; French, 48*s.* to 53*s.* 6*d.*; Spanish, 44*s.* to 46*s.*; Trieste and Hungarian, 64*s.* to 76*s.*; Chilian and California, 42*s.* to 48*s.*; American, western State, (per barrel,) 28*s.* to 31*s.*; extra State, 30*s.* to 34*s.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.*; Canadian, 32*s.* to 34*s.*

In Paris prices tended upward during the first half of the month, and ranged from 44*s.* 10*d.* to 49*s.* 4*d.*

MAIZE.—*London.* White, per quarter, 31*s.* to 33*s.*; yellow, 27*s.* to 29*s.* *Liverpool.* American white, per quarter, 31*s.* to 33*s.*; do. yellow, 27*s.* 6*d.* to 28*s.*; Trieste, 27*s.* 6*d.* to 28*s.*; Danubian, 27*s.* 6*d.* to 29*s.*; Galatz, 28*s.* 6*d.* to 29*s.* 6*d.*

WOOL.—The wool trade exhibited no special activity. At the regular sales of colonial wool Australian was in good request, and brought steady prices. The uniform quotations of the first three weeks of May were as follows: Southdown hoggets, 1*s.* 10*d.* to 1*s.* 11*d.* per pound; half-breed do., the same; Kent fleeces went a half-penny higher; Southdown ewes and wethers, 1*s.* 5*d.* to 1*s.* 6*d.*; Leicester, 1*s.* 9*d.* to 1*s.* 10*d.* The month closed with a general reduction of half-penny upon the above prices.

BUTTER.—Dorset, 120*s.* to 124*s.* per cwt.; Friesland, 98*s.* to 106*s.*; Jersey, 88*s.* to 98*s.*

CHEESE.—Cheshire, 80*s.* to 90*s.* per cwt.; double Gloucester, (new,) 70*s.* to 82*s.*; Cheddar, 80*s.* to 94*s.*; American, 60*s.* to 80*s.*

LIVE-STOCK.—During the last week in May the total imports of foreign live-stock into London amounted to 16,147 head; the receipts of the corresponding week of several previous years were as follows: 1871, 17,195; 1870, 17,868; 1869, 16,637; 1868, 5,907. Of the receipts of the week ending May 31, 1873, 1,109 were cattle, 13,556, sheep and lambs, 788 calves, 694 pigs. The prices during that week ranged as follows: Coarse and inferior beasts, (per 8 pounds,) 5*s.* 4*d.* to 5*s.* 8*d.*; second quality, 5*s.* 10*d.* to 6*s.*; prime large oxen, 6*s.* 2*d.* to 6*s.* 4*d.*; prime Scots, short-horns, &c., 6*s.* 6*d.* to 6*s.* 8*d.*; coarse and inferior sheep, 5*s.* to 5*s.* 6*d.*; second quality, 5*s.* 8*d.* to 6*s.*; prime coarse wooled, 6*s.* to 6*s.* 2*d.*; prime Southdowns, 6*s.* 2*d.* to 6*s.* 4*d.*; large coarse calves, 5*s.* to 5*s.* 8*d.*; prime small do., 6*s.* to 6*s.* 6*d.*; large hogs, 4*s.* 4*d.* to 4*s.* 10*d.*; small porkers, 5*s.* to 5*s.* 6*d.*; lambs, 8*s.* to 8*s.* 6*d.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

AUGUST AND SEPTEMBER,

1873.

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1873.

MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
Statistical Division, September 24, 1873.

SIR: I submit herewith for publication a report of crop returns for August and September, a statement of current market prices of principal farm products, a condensation of statistical collections of this Division, and a mention of the mission of the Statistician to Europe; together with contributions from other Divisions of the Department, including entomological records, results of microscopic investigation, a treatise on the osier willow by the Commissioner of Agriculture, some mention of the linen industry of Silesia, of the beet-sugar industry, and of the culture and manipulation of tea.

J. R. DODGE,
Statistician.

HON. FREDK. WATTS,
Commissioner.

REPORT OF CROP RETURNS.

WHEAT.

The average condition of the wheat-crop for the entire country, according to the returns of the present month, is 95. A comparison with the September averages of last year will illustrate the crop prospects of the present, when the increased wheat area of the present season is duly considered:

States.	September, 1873.	September, 1872.	States.	September, 1873.	September, 1872.
Maine	83	109	Louisiana	----	112
New Hampshire	95	95	Texas	85	120
Vermont	96	91	Arkansas	95	106
Massachusetts	102	97	Tennessee	78	116
Rhode Island	----	----	West Virginia	91	96
Connecticut	104	98	Kentucky	85	110
New York	72	85	Ohio	97	84
New Jersey	105	89	Michigan	96	95
Pennsylvania	102	76	Indiana	84	97
Delaware	85	92	Illinois	93	95
Maryland	96	74	Wisconsin	107	98
Virginia	82	99	Minnesota	109	104
North Carolina	82	109	Iowa	100	100
South Carolina	75	102	Missouri	100	70
Georgia	75	104	Kansas	100	85
Florida	----	----	Nebraska	107	109
Alabama	85	105	California	92	----
Mississippi	90	102	Oregon	107	96

Reports were received from 844 counties, of which 246 were average, 185 above, and 413 below. The principal wheat-producing States are thus represented:

States.	Counties above average.	Counties average.	Counties below average.	States.	Counties above average.	Counties average.	Counties below average.
Kentucky	3	10	19	Minnesota	17	4	7
Ohio	9	16	17	Iowa	16	15	18
Michigan	10	13	7	Missouri	14	18	23
Indiana	1	10	32	Kansas	13	9	14
Illinois	11	10	21	Nebraska	9	4	3
Wisconsin	16	9	.....	California	3	8	11

The wheat of Northern New England was injured by drought in June, and the quantity will be less than usual, while the quality is generally good. Massachusetts and Connecticut will have a fully average yield upon an area too small to be of essential aid in the bread supply.

From counties representing the largest portion of the wheat area of the State of New York, 35 in number, only 2, Tioga and Wyoming, give figures higher that 100; 14, of which only Yates is of any wheat-growing prominence, return 100; Monroe, which usually grows one-twelfth of the crop, claims but 65, Livingston 45, Ontario 75, Genesee 40, Steuben 91, Seneca 80; these counties usually yielding above half a million bushels each. Thirteen counties, which produced nearly seven millions in 1869, average 70; and the general average of all is 72. The quality is good, except in cases of slight damages by rains in harvest. A single county in New Jersey, Union, reports condition less than 100; Bergen, Gloucester, Monmouth, Sussex, and Essex return 100; Salem, 180; and Warren, Camden, and Cumberland, 110. The average is 105. The harvest was secured in excellent condition. Returns from 37 counties in Pennsylvania, which represent about four-fifths of the crop, average 102; 11 range from 50 to 97; 12 are put at 110, among which are Lancaster and York, together producing more than three millions of bushels. The grain thrashes out satisfactorily and makes an unusually good quality of flour. The yield in Maryland appears to be 4 per cent. less than an average, of good quality except where injured by rains before or after harvesting. The best reports are from Frederick and Washington, which are large producers.

The present has not been a good wheat year in the South. The average for Virginia is but 82, the deterioration being attributed to rain when wheat was in bloom, and to subsequent droughts while maturing. A prominent cause was doubtless insufficient preparation and fertilization, as large yields were obtained in several instances of good cultivation—in one case in Essex, a field of five acres yielding 140 bushels. The reports from North Carolina average 82 also, and those of South Carolina and Georgia 75, Alabama and Texas 85, and Mississippi 90, very few counties reporting wheat east of Texas. The reporter in Dallas County, in the latter State, claims an average yield of 20 bushels per acre. Arkansas and Tennessee have better crops than the Gulf-coast States, but not a full average.

A full crop has not been secured in West Virginia, the causes of depreciation being the midge, smut, rust, and rain in the shock. In several counties the yield is better than was anticipated. Kentucky falls

15 per cent. below average, as a whole, though some counties report one of the best crops ever obtained. There is much complaint of unwholesome flour from wheat grown in low lands.

Ohio reports cover more than half the area in wheat, and indicate a very nearly average yield, of about average quality, in some places quite good, in others somewhat shrunken and yielding less than was expected. Among the counties making the best returns are Miami, Butler, Greene, Shelby, Jefferson, Medina, and Coshocton.

Michigan has nearly a full crop of wheat of very good quality, well secured, and generally exceeding the expectation in thrashing. Several fields of not less than 48 bushels per acre are reported in Mecosta County. Oakland, which can usually send a million bushels to market, is reported at 100, and Kalamazoo at the same figure. Genesee, which produces more than half a million, is represented by 113. Only 7 counties report less than 100.

In Indiana this crop has suffered from winter-killing, the fly, chinch-bug, and heavy rains in the shock, causes which indicate a depreciation of 16 per cent. A white-bearded variety in Wabash has yielded 35 bushels per acre. Wayne, Marshall, Wells, Whitley, all wheat-producing counties, make returns of 100; other counties of much prominence range from 75 to 90.

In 43 counties of Illinois the average is 93. Among the counties making returns above 100 are Carroll, Winnebago, De Kalb, De Witt, Warren, Marshall, Lee, Clinton, Schuyler, Rock Island, Hancock; counties returning 100 are Crawford, Pike, Marion, Champaign, Putnam, Effingham, Ogle, Stark, Mason, Cass. Spring-wheat has been injured to some extent by chinch-bugs, rust, and storms. The assessor in Jersey reports an area of 49,000 acres, which the thrashers find to yield variously from six to fifteen bushels per acre. The Odessa wheat from the Department yields from 18 to 30 bushels per acre, and gives much satisfaction.

Wisconsin makes very encouraging returns, in no case below 100, and averaging 107 upon an increased area. Dane County, almost always good for two or three millions of bushels, returns 100, and Dodge County, also exceeding two millions, claims 120. Several large counties claim a yield 10 per cent. better than an average.

Minnesota is the banner State of the year in wheat-production. A large increase in acreage in new and old counties was returned in June; and the average for condition is 109. Wabasha, a county annually yielding between one and two millions of bushels, returns 125; and of other counties of similar importance Goodhue and Winona send 110, and Fillmore 105. Only 7 counties report a figure less than 100. In several counties it is claimed to be the best crop for many years, both for quality and quantity.

Returns from two-thirds of the wheat area of Iowa indicate an average yield upon an increased area. The quality is generally superior with some exceptions of injury from rains and blight. Most of it was secured in good condition.

Missouri has secured an average crop, mostly of good quality. Chinch-bugs caused a reduced yield in some counties.

In Kansas the yield is nearly an average, though much reduced by chinch-bugs and rust in several counties.

The crop of Nebraska is large and the quality excellent.

The crop of California is not so good as was expected; a large reduction from the yield of last year may be calculated upon. In Sonoma the yield will be large, and the return for Stanislaus is 100, Santa Clara

96, Contra Costa 95, San Joaquin 80, and several small counties 75. The average condition in 24 counties is 93.

In Oregon no county reports less than 100, the average being 107. In Grant County the lowest figure named for the average yield is 25 bushels.

The reports from the Territories are generally favorable. It is claimed that the county of Walla-Walla, in Washington, can export 500,000 bushels, and that the average yield is 35 bushels per acre; some large fields 67 bushels.

MAINE.—*Piscataquis:* All kinds of small grain well filled, but thin on the ground; killed out by worms and drought; wheat of better quality than usual, but not so much of it. *Oxford:* Pinched by drought.

NEW HAMPSHIRE.—*Carroll:* Many wheat-fields injured by drought in June. *Hillsborough:* Injured by drought.

VERMONT.—*Grand Isle:* Grain filled well.

CONNECTICUT.—*Hartford:* Unusually bright and fine.

NEW YORK.—*Chemung:* Injured by rain in harvest. *Yates:* Fultz successful. *Albany:* Good and well secured. *Wyoming:* Mostly good and well secured. *Genesee:* Fine, but the smallest crop for years. Tappahannock and Fultz do well. *Erie:* Small yield, but good; Fultz did well; Tappahannock not so well.

NEW JERSEY.—*Warren:* Good yield; fine grain and flour. *Cumberland:* Harvested in excellent condition.

PENNSYLVANIA.—*Northampton:* Good in quantity and quality; straw and grain fully 50 per cent. better than last year. *Berks:* Thrashes out more than usual per hundred sheaves, and yields superior flour. *Clinton:* Touzelle from the Department fine; four quarts yielded sixty quarts; Tappahannock not successful. *Indiana:* Good quality and condition. *Greene:* Cut in good order, but somewhat damaged in the shock. *Tioga:* Straw light; grain good.

MARYLAND.—*Baltimore:* Secured in good order; but light rains in harvest. *Howard:* Harvested in fine condition, but injured by recent rains. *Saint Mary's:* Injured by wet in the shock; one-fourth thought to be ruined. *Cecil:* Berry very good; product below average.

VIRGINIA.—*Charlotte:* Greatly below expectation in quantity, but of good quality. *Powhatan:* Thrashed out poorly; farms usually producing thousands of bushels will this year turn out only hundreds; this is due to heavy rains while the wheat was in bloom. Tappahannock yielded abundantly in spite of all the drawbacks. *Pulaski:* Not thrashing out well; quality poor; Fultz did well. *Frederick:* Fultz a great success in every case. *Patrick:* Touzelle frozen out; White California also a failure. It seems that no light-colored wheat will succeed here. *Amelia:* Yield below expectation; less than last year. *Shenandoah:* Below expectation, both in quantity and quality. *King George:* Light, but good; some sprouting in the shock. *Buckingham:* Harvested in fine condition, but reduced 25 per cent. by drought, smut, chinch-bugs, &c. *Floyd:* Tappahannock does well; Touzelle too late in ripening. *King and Queen:* Better than last year. *Essex:* Disappointment in yield; Fultz best; Tappahannock next. A field of five acres, seeded with 7 bushels, produced 140 bushels, or 28 bushels per acre after thrashing. The same field three years ago produced but 70 bushels of Tappahannock, or 14 bushels per acre. Many improved small fields this year yielded from 18 to 28 bushels per acre. *Goochland:* Fultz universally satisfactory. *Highland:* Short, but good. *Mecklenburg:* Touzelle from the Department did tolerably, but its straw is too weak. *Prince George:* Two-thirds of a crop.

NORTH CAROLINA.—*Lincoln:* Fultz, in every case, excelled in both yield and quality. *Caswell:* Experimental culture of Touzelle very successful. *Person:* Greatly improved by recent rains, but will not reach an average. *Alamance:* Thrashes out well; good grain. *Burke:* Tappahannock from the Department has made the finest yield ever known here; Fultz has done well. *Clay:* Tappahannock did well. *Perquimans:* Wheat culture almost abandoned; yield, five bushels per acre. *Polk:* Tappahannock fine; Touzelle a failure. *Wilkes:* One-third of a crop. *Stanly:* Fultz and Tappahannock successful; Touzelle poor.

SOUTH CAROLINA.—*Chesterfield:* Fultz does well, but is not weevil-proof; Tappahannock does better.

ALABAMA.—*Blount:* Poor in quantity and quality; Tappahannock did well; Touzelle worthless. *Coffee:* Good.

FLORIDA.—*Santa Rosa:* Tappahannock successful. *Suwannee:* Tappahannock and Touzelle flat failures.

TEXAS.—*Red River:* Harvested in the rain, and consequently injured greatly; saved about 14 bushels per acre; Touzelle did poorly, but the Tappahannock was fine. *Coryell:* Thrashed in fine condition. *Dallas:* Will average 20 bushels per acre of full

plump grain. *Burnet:* Yield from 4 to 7 bushels per acre. *Atascosa:* Grasshoppers destroyed the small grains. *Bandera:* Fultz promising, but destroyed by frost and grasshoppers.

ARKANSAS.—*Boone:* Injured by wet summer and dry fall last year.

TENNESSEE.—*Jackson:* A good deal of *sick* wheat here. *Rhea:* Quality good; Fultz wheat suits the climate. *Loudon:* very little No. 1 wheat raised this season. *Hamilton:* Short but good grain. *Washington:* Many fields will not return their seed. *Greene:* Injured in the shock by rain. *Carter:* Red wheat damaged by scab; white generally of good quality. *Lincoln:* Tappahannock well adapted to the climate; yield, 25 bushels per acre. *Hardin:* Injured somewhat by rains in the shock. *Coffee:* Light and poor. *Monroe:* Good on well-drained land properly prepared, but generally poor. *Sullivan:* Poorest yield, both in quantity and quality, since the war; where proper cultivation and fertilization were used a crop of 25 bushels per acre was realized by "book-farmers." Fultz appears to be exempt from the ravages of the fly; it is hardy and prolific. *Grainger:* Fultz wheat is a grand success; yields more and stands winter better than any other variety.

WEST VIRGINIA.—*Hardy:* Injured by rain in the stack. *Mineral:* Considerably injured by wet. *Pocahontas:* Fair. *Raleigh:* Did better than was expected; filled finely. *Tucker:* Failure through rust; in some places not worth cutting. *Brooke:* Sprouting in the stack; damage 10 per cent. *Grant:* Less than was expected. *Jackson:* Less than was expected. *Putnam:* Injured by white blight, midge, and smut, as well as by rain, in the shock. *Monongahela:* Very poor. *Randolph:* Much better than was anticipated.

KENTUCKY.—*Taylor:* Badly rusted and scabbed in many cases. *Laurel:* A great deal of "sick" wheat thrashed out. *Marion:* Much affected with scab; millers report a great deal of "sick" wheat. *Shelby:* Fultz averaged 30 bushels per acre. *Boone:* A quart of Tappahannock brought 40 pounds of wheat. *Lewis:* Excelled any former crop. *Scott:* Fultz a success. *Anderson:* Average. *Lincoln:* Better than was expected. *Logan:* Did not thrash out as well as was expected; some wheat raised on low land called sick wheat; its flour causes sickness at the stomach when eaten. *Anderson:* About average. *Fayette:* Quality below average. *Hardin:* Fultz a great success; 2 bushels on two acres produced 83 bushels of measured grain.

OHIO.—*Coshocton:* Secured in good condition. *Hardin:* Tappahannock yielded more abundantly, but of lighter grain; appears to hybridize successfully with Lambert and Mediterranean. *Jackson:* Thrashing out better than was expected. *Stark:* Rusted. *Delaware:* Will rate in market as No. 2. *Greene:* About average in quality; some of it shriveled. Tappahannock ripened about seven days before the common varieties. Fultz five days in advance of other varieties, though sown fourteen days later. Each variety produced about a bushel to the four quarts. *Marion:* Has not turned out as well as was expected, being somewhat shrunk. *Vinton:* Fultz wheat from the Department excels all others; it is a great success here. *Mercer:* Light, but fair.

MICHIGAN.—*Calhoun:* Harvested in good order. *Gratiot:* Never harvested better; best crop ever raised here. *Saint Joseph:* Full average in quality; quantity deficient. *Hillsdale:* Winter-killed. *Jackson:* Good quality; thrashing out larger than was expected. *Oakland:* Good, and in good condition. *Lapeer:* Light, but good and well secured. *Mecosta:* Winter-wheat extra; one field averaged 48 bushels per acre, and others are expected to thrash out still better.

INDIANA.—*Decatur:* Much damaged by rain in the shock. *Gibson:* Poor on bottom-lands. *Jennings:* Yield reduced to 6 or 7 bushels per acre by fly and chinch-bug. *Morgan:* Yield tolerable; quality fair. *Noble:* Good, when not winter-killed. *Switzerland:* Harvested light. *Wabash:* We find a white-bearded wheat the best variety; it yields 35 bushels per acre without manure; no name for it; it was sent here by express and sold for charges, no one claiming it. *Dubois:* Shorter and poorer than was expected. *Hamilton:* Will average 10 bushels per acre. *Orange:* From 5 to 20 per cent. below expectations; injured by rain in the shock. *Brown:* Short, but good; not over 7 bushels per acre. *Harrison:* Not so good as was expected. *Boone:* Grains defective. *Wells:* Yields well. *Owen:* Injured by heavy rains after cutting. *Hancock:* Injured one-half since cutting; previously suffered from chinch-bugs. *Dearborn:* Did not thrash out as well as was anticipated. *Clay:* Thrashes out poorly for the amount of straw.

ILLINOIS.—*Morgan:* Did not fill well; blown down and washed away in many places. *Sangamon:* Badly rusted in the south part of the county. *Clinton:* Thrashing out better than was expected. *Lawrence:* Not thrashing out as well as was expected; increased acreage will be sown. *Vermillion:* Three-fourths shriveled; one-fourth plump. *Jersey:* Yield very disappointing; 6 to 15 bushels per acre; the assessor reports 49,000 acres. *Schuyler:* Tappahannock wheat a failure. *Winnebago:* Crop good; Odessa wheat sent from the Department several years ago has become quite popular, yielding at the rate of 18 to 30 bushels per acre of 64 pounds each; China-tea wheat yields from 12 to 25; wheat bringing from $1 to $1.06 per bushel. *Lee:* Plump and fair, averaging 20 bushels per acre. *Boone:* Spring-wheat a fair yield, though injured by chinch-

bugs in some places. *Effingham:* Acreage increased, but crop somewhat diminished. *Ogle:* Spring-wheat good, and harvested in fine condition. The Provence spring-wheat from seed furnished by the Department failed to head; it is probably a winter variety. *De Kalb:* Exceedingly fine. *Cass:* Turning out poorly. *Mason:* Average yield; good quality.

WISCONSIN.—*Waukesha:* Best yield since 1860; gathered in prime order. *Calumet:* Tappahannock yielded 20½ bushels per acre; ten days earlier than the common wheat. *Dane:* Best crop for years, in spite of drought and chinch-bugs. *Dodge:* Averages 18 bushels per acre; being marketed very rapidly. *Pierce:* Good quantity and quality. *Walworth:* Better than was expected. *Washington:* Will average 20 bushels per acre; all kinds did well except Club, which rusted badly and is scarce worth screening. *Outagamie:* Spring wheat thrashing out wonderfully. *Clark:* Increased attention to winter wheat.

MINNESOTA.—*Wright:* Harvested in fine condition; good quality and average quantity; prices low. *Blue Earth:* Good; the much sought Red Osauka has rusted badly. *Carver;* Thrashing-machine men report winter wheat as averaging 30 to 35 bushels, and spring wheat 18 to 20 bushels per acre. *Waseca:* Wheat never filled better. *Dodge:* Promises to be the best crop for many years; Red Osauka rusted badly. *Winona:* Crop never finer. *Sherburne:* Good quality and condition, but one-fourth short. *Cottonwood:* Fine but light. *Goodhue:* Spring wheat well secured; thrashing out more abundantly than last year. *Steele:* A little less than last year but of better quality, and secured in better condition for market; the increased acreage will make it the best crop yet grown here; 90 to 95 cents per bushel. *Houston:* Above average, of excellent quality and secured in good order. *Jackson:* Short, but good. *Nicollet:* Mostly No. 1. *Renville:* Looks well, but below expectations on thrashing. *Benton:* Stacked in splendid condition. *Fillmore:* Nearly all in the stack and uninjured by rain. *Mower:* Finer than for many years. *Stearns:* Harvested in good condition; good quality. *Wabasha:* Mostly thrashed in good condition.

IOWA.—*Adair:* Provence wheat did not head; soil too rich for it. *Crawford:* Fine harvest weather; injured somewhat by hail, but improved 25 per cent. by increased acreage and improved quality of the grain. *Tama:* Good quality and condition; yield averages 12 bushels per acre. *Woodbury:* Injured 25 per cent. by grasshoppers; Australian spring wheat from the Department a failure, through the ravages of grasshoppers. *Benton:* Benefited by late fine weather. *Calhoun:* Straw heavy but heads somewhat blighted. *Chickasaw:* Never better; plump, bright, and well secured. *Cass:* Yield 17 bushels per acre; an average crop. *Blackhawk:* Superior both in quantity and quality. *Guthrie:* Some good, others indifferent; rotation here of only wheat and corn; about equal to no rotation at all. *Polk:* Somewhat smutted. *Jackson:* No. 1 in quality, but decreased yield. *Shelby:* Barely average, disappointing high expectations. *Harrison:* Injured by blight and rains; will average 18 bushels per acre. *Mitchell:* Well harvested. *Taylor:* Averages from 18 to 25 bushels per acre; Provence wheat did poorly. *Johnson:* Spring wheat above average.

MISSOURI.—*Moniteau:* Does not thrash out as well as was expected; Tappahannock a failure; freezes out worse than ever; Norman wheat has been successful here for twenty-five years. *Platte:* Saved in good condition; selling at $1.25 per bushel. *Cape Girardeau:* Tappahannock and Fultz wheats about equally successful. *Crawford:* Tappahannock has done extremely well, as also the Fultz. *Perry:* Fultz a great success. *Ralls:* Yield unusual; quality good. *Taney:* Tappahannock the best of six varieties sown. *Worth:* Far better than was expected; some fields yielded 26 bushels per acre. *Grundy:* Tappahannock does not suit the climate. *Dallas:* Good crop but light. *Laclede:* About three-fourths of a crop; reduced by chinch-bugs.

CORN.

The yield of maize will be considerably lower than that of last year. None of the principal corn-producing States return as high an average as in September of 1872. Minnesota in the west and New Jersey in the east report relatively and absolutely high averages. Maryland, Virginia, and Florida present relatively higher figures, and all other Southern States lower than in 1872, though those upon the Atlantic coast promise an average crop. The yield of the Southwestern States was unusually large last year, but will be considerably under an average the present season. It suffered from too much moisture on bottom lands. It is also a noticeable fact that in the States where rains have been most injurious, reports of local droughts are somewhat numerous. Complaints of low vitality from bad seed are common in Ohio and Michigan. Summer droughts

were injurious in portions of the same States, and in Indiana, Illinois, Iowa, Missouri, and Kansas. The crop is generally reported as two weeks later than usual. Chinch-bug injuries are reported in Indiana, Illinois, Missouri, and Kansas. Grasshoppers proved destructive in sections of Wisconsin, Iowa, and Kansas.

The acreage appears to be about 4 per cent. less than in 1872—a reduction equivalent to more than a million acres, mostly in Ohio, Indiana, Iowa, and Illinois, more than half of which is in the latter State.

The number of counties reporting corn is 1,014, of which 222 make average reports, 211 higher than average, and 581 lower. The following is the statement in full:

States.	Counties above average.	Counties average.	Counties below average.	States.	Counties above average.	Counties average.	Counties below average.
Maine	0	1	11	Texas	8	6	38
New Hampshire	1	6	1	Arkansas	5	10	12
Vermont	1	2	6	Tennessee	15	10	25
Massachusetts	1	6	9	West Virginia	17	7	5
Rhode Island	0	2	1	Kentucky	10	5	18
Connecticut	0	1	4	Ohio	5	11	26
New York	4	6	25	Michigan	0	7	23
New Jersey	4	5	3	Indiana	6	10	27
Pennsylvania	7	8	22	Illinois	1	5	36
Delaware	0	0	1	Wisconsin	3	7	16
Maryland	1	3	7	Minnesota	8	12	8
Virginia	23	12	24	Iowa	1	10	38
North Carolina	19	15	18	Missouri	1	5	52
South Carolina	2	2	11	Kansas	1	4	31
Georgia	27	12	15	Nebraska	1	3	12
Florida	11	4	4	California	3	8	8
Alabama	11	5	15	Oregon	5	3	1
Mississippi	3	4	18				
Louisiana	6	5	10	Total	211	222	581

MAINE.—*Penobscot:* Improved during August. *Waldo:* Suffering for rain. *Oxford:* Injured by drought and frost. *Franklin:* Suffered from drought and cold nights in August.

VERMONT.—*Rutland:* Promising. *Caledonia:* On the river crops are dried up; on the uplands seldom better. *Franklin:* Full average but backward. *Orleans:* Not so forward as last year. *Grand Isle:* Greatly improved of late. *Chittenden:* Ripening finely.

MASSACHUSETTS.—*Plymouth:* Looks well. *Norfolk:* Good but short.

RHODE ISLAND.—Early plantings suffered from drought; yield will be 10 per cent. above average of ten years past.

NEW YORK.—*Delaware:* Crops late: a warm fall will make a full crop. *Wyoming:* Greatly improved. *Otsego:* With a warm September the crop will be large. *Livingston:* Maturing slowly. *Genesee:* Late but fair growth of ears. *Seneca:* Late. *Erie:* Spotted; first planting good; much replanted on account of cut-worms. *Sullivan:* Ten days late; would be much injured by an early frost.

NEW JERSEY.—*Warren:* Stalking finely. *Camden:* In many places scalded. *Gloucester:* Crop heavy but backward. *Hudson:* Corn good and nearly out of danger. *Burlington:* Weather too cloudy and rainy for late corn to ripen fast. *Essex:* Greatly improved by the abundant rains of August.

PENNSYLVANIA.—*Northampton:* Looks fair. *Wyoming:* Threatened by frost in fields back from the river. *Lehigh:* Backward but growing. *Northumberland:* Damaged by late rains. *Westmoreland:* Greatly improved. *Clearfield:* Kept back by rain. *Beaver:* Late; in danger from frost. *Armstrong:* Extra growth of late plantings; if frosts delay the crop will be large. *Juniata:* Thin on the ground but thrifty. *Lycoming:* Thin on the ground but good ears and grains. *Indiana:* Doing finely. *Tioga:* Heavy crop in prospect. *Franklin:* Injured by hail in some places. *Elk:* Had to be replanted; stand poor and late. *Lawrence:* Late corn greatly forwarded by the warm weather.

DELAWARE.—*Kent:* Greatly improved by late rains.

MARYLAND.—*Frederick:* Prospect never better. *Baltimore:* Improved by late rains. *Washington:* Improved to average by late rains. *Charles:* Improved; may reach average.

VIRGINIA.—*Prince George:* Poorest crop for many years. *Charlotte:* Seriously injured by drought; late rains too late for its recovery. *Warwick:* Early-planted corn suffered from drought; late plantings improved by late rains. *Rappahannock:* Promising. *New Kent:* Much improved by late rains. *Henrico:* Greatly injured by drought. *Bedford:* Damaged by heavy storms. *Lunenburg:* Good weather and fair prospects. *Patrick:* Much injured by drought. *Caroline:* Saved by late rains. *Amelia:* Damaged by drought. *Middlesex:* Best crop in four years. *Shenandoah:* Crops increased to an average. *Page:* Extraordinary crop. *King William:* Shortened by drought. *Rockingham:* Largest crop ever grown. *Nelson:* Wonderfully improved. *Campbell:* Very fine. *Fairfax:* Never more promising. *Washington:* Good in some places, poor in others. *Prince William:* Growth heavy, but backward. *Orange:* Needs dry weather to mature. *James City:* Improved by late rains. *Spottsylvania:* Greatly improved by late rains. *Warren:* Looks remarkably well. *Surrey:* Improved and promising. *James City:* Improved by late rains. *Orange:* Best crop since 1865. *King George:* Greatly improved. *Southampton:* Acreage decreased; crop good. *Clarke:* Backward. *Essex:* Greatly improved by late rains. *King and Queen:* Much improved; better than last year. *Chesterfield:* Wonderfully improved. *Grayson:* Great improvement by late rains. *Highland:* Full and fine crop; fine season. *Mecklenburg:* Injured by chinch-bug. *Loudon:* Injured by bud-worms and bore-worms.

NORTH CAROLINA.—*Lincoln:* Promises a fine yield. *Robeson:* Benefited by late rains; generally good. *Sampson:* Damaged on low lands. *Caswell:* Injured by drought in the fore part of the season. *Davidson:* Greatly improved by late rains. *Mecklenburg:* Corn would have been a large crop if the rain had not prevented its being worked. *Moore:* Best crop for several years. *Chowan:* Rapidly improved. *Gaston:* Destroyed by floods on very low lands; good on other lands. *Hertford:* Crop magnificent. *Alamance:* Upland crops greatly improved by late rains. *Edgecombe:* Good. *Harnett:* Looks very fine where well cultivated. *Cumberland:* Prospect very good. *Greenville:* Greatly improved. *Rowan:* Greatly improved by late rains. *Newbury:* Fodder nearly destroyed by rains. *Franklin:* Improved by August rains and fine where well cultivated. *Camden:* Damaged by heavy rains. *Madison:* Improved. *Gadkin:* Much improved by late rains. *Anson:* Sandy lands had too much rain for a good crop. *Stanley:* Greatly brought out by late rains. *Wilkes:* Greatly improved by late rains.

SOUTH CAROLINA.—*Fairfield:* A complete failure on river and creek bottoms. *Clarendon:* Shortened by early drought. *Bertie:* Very good. *York:* Rapidly improving. *Orangeburg:* Yield light; fodder inferior. *Edgefield:* Good average. *Union:* Will supply two-thirds the home demand.

GEORGIA.—*Lincoln:* Corn prospects not so good. *Taylor:* Not so good as was expected. *Richmond:* Shortened one-fourth by drought of June and July. *Carroll:* Late corn on bottom-lands has done better than was expected. *Dooley:* Injured by rain. *Gwinnett:* A good average. *Clinch:* Crop made. *Calhoun:* Crop good. *Baldwin:* Increased average and yield. *Brooks:* Good. *Wilkes:* Upland corn well worked is very fine; much of the lowland plantings worthless on account of excessive rains. *Jackson:* Looks well for the work it has received. *Heard:* Very fine. *Whitfield:* Matured and fine. *Franklin:* Reduced by drought.

FLORIDA.—*Santa Rosa:* Pennsylvania yellow corn a success. *Orange:* Fine weather for potatoes. *Madison:* Early corn not so well developed as last year. *Jefferson:* Crop good. *Taylor:* Finest prospect ever known. *Hillsborough:* Reported as the finest crop ever gathered here; this results from improved farming. *Wakulla:* Crop made but damaged by late rains; much sprouted on the stalks. *Jackson:* Crop larger than last year. *Terry:* Splendid; better than for years. *Suwannee:* Yellow field-corn from the Department a success.

ALABAMA.—*Greene:* Corn suffering for work on account of wet. *Saint Clair:* Crop fine; Pennsylvania yellow corn doing well. *Hale:* Very fine. *Clarke:* Crop light, through excessive rains. *Crenshaw:* Yellow corn from the Department a success. *Pike:* A failure in half the county; crops good in the other half. *Blount:* Excellent on high lands; inferior in low lands; good general average. *Geneva:* Crop good as could be expected or desired; the yellow corn from the Department four weeks earlier than the common varieties; can make two crops of it in a season. *Coffee:* Crop good. *Montgomery:* Good. *Calhoun:* Full average in spite of local droughts. *Marshall:* Finest crop ever raised here. *Jefferson:* Best crop in eighteen years. *Marengo:* Very poor; neither fodder nor ears to any great extent.

MISSISSIPPI.—*Grenada:* Crop fine with good culture; otherwise it is poor. *Jasper:* Corn crop made, and is light. Cooly corn did well. *Wilkinson:* Great rot produced by rain. *Attala:* Short crop. *Tishemingo:* Full average. *Kemper:* Shortened by wet spring and summer drought. *Lee:* Not a heavy crop, but enough to supply home demand. *Winston:* Early corn from the Department ripens earlier than any other kind; will make two crops per year. *Madison:* Not so good as was anticipated.

LOUISIANA.—*East Baton Rouge:* Corn almost a dead failure. *Avoyelles:* Bad condition. *Saint Mary:* Too wet for corn. *Terre Bonne:* Too wet for corn. *Morehouse:* Extra

fine. *Franklin:* Better than for many years. *Richland:* Corn made; large crop. *Carroll:* Large crop; better than for years. *Bossier:* Hill crops fine; bottom crops injured by freshets.

TEXAS.—*Red River:* Crop greatly improved; the "Pennsylvania Early" did splendidly; ready to crib the last of July. *Victoria:* Excessive rains prevented making; crops suffering in consequence. *Polk:* Rotting badly in the fields. *Coryell:* Good condition but short. *Dallas:* Excessive rains cut down the yield to 25 or 30 bushels per acre. *Wharton:* Glowing prospect. *Burnet:* Nearly average on light, sandy soils; below average on heavy black soils; cut-worms injurious. *Rusk:* Above average. *Austin:* Rotting considerably. *Bell:* Fine; large surplus on hand. *Cooke:* Short. *Hill:* Good, but not equal to last year's crop. *Lamar:* Short; too much rain. *Matagorda:* Enough for home wants. *Marion:* Better than for years. *Medina:* Ripened prematurely. *Anderson:* Caterpillars plenty.

ARKANSAS.—*Independence:* Short. *Sebastian:* Shortened by drought. *Prairie:* Early corn filled well; late doing well. *Arkansas:* Very good. *Union:* Neglected for cotton, and hence far below average; excellent where well worked. *Marion:* Early corn suffered; late corn good; the whole about average. *Baxter:* Shortened by drought.

TENNESSEE.—*Decatur:* Half a crop. *Coffee:* With one more rain our corn crop will be the best for years. *Sumner:* Late corn suffering for rain. *Roane:* At least average. *Giles:* Average. *Putnam:* Light crop. *De Kalb:* Magnificent. *Hickman:* Late corn seriously damaged by drought. *Sullivan:* Shortened by drought, but good crops were raised by those who cultivated them intelligently. *Grainger:* Fine season and large crop. *Shelby:* Worst crop for years; not half enough realized for home consumption the coming year. *Lawrence:* Injured by drought. *Jackson:* Injured by excessive rains in June and July. *Rhea:* Prospect good; Pennsylvania Yellow ripened; ripens forty days earlier than the common varieties. *Dickson:* Good where well cultivated. *Hamilton:* Extra fine. *Smith:* Greatly improved by fine weather. *Washington:* Very promising in spite of drought. *Greene:* Splendid.

WEST VIRGINIA.—*Jefferson:* Large growth, but backward. *Mercer:* Badly damaged by grub-worms. *Pleasants:* Some crops injured by worms. *Pocahontas:* Fine. *Pendleton:* Increased growth. *Monongalia:* Quite promising. *Monroe:* Shortened by drought. *Lewis:* Too wet for corn.

KENTUCKY.—*Taylor:* Greatly shortened by drought. *Clark:* Shortened by drought. *Jefferson:* Season favorable. *Shelby:* Best average crop for five years. *Mercer:* Shortened by drought. *Edmonson:* Shortened by drought. *Lewis:* Never better. *Anderson:* Very fine crop; best since 1855. *Graves:* Worst prospect for eighteen years. *Lincoln:* Unusually good. *Logan:* Improved by late rains. *Warren:* Late plantings damaged by August drought. *Fayette:* Above average. *Owen:* Best crop since 1855.

OHIO.—*Coshocton:* Doing well, but ten days late. *Jackson:* Doing splendidly; out of danger from frost. *Logan:* Very uneven; where submerged by freshets it is likely to far exceed average crops. *Stark:* Poor stand on account of damaged seed. *Butler:* Improved rapidly; needs two weeks of good weather to ripen. *Delaware:* At least 25 per cent. below last year. *Greene:* Coming on finely, but late. *Marion:* What corn there is looks promising; needs two or three weeks' exemption from frost. *Holmes:* Full average, but will ripen late. *Vinton:* Injured by wet; earing imperfectly; some of it still weedy. *Warren:* Looks splendidly. *Mercer:* Shortened by drought. *Defiance:* Drying up on heavy clay-lands. *Athens:* Reduced below average by the destruction of some of the best crops by freshets.

MICHIGAN.—*Wayne:* Late corn suffering from drought; many pieces cut up for fodder; crop generally good. *Macomb:* First plantings generally failed. *Lapeer:* Cut-worms and bad seed caused replantings, and hence the crop is late. *Hillsdale:* Short on account of worms, bad seed, and June drought. *Jackson:* Has come forward very rapidly, and is now fit to cut. *Oakland:* Doing well on moist land, but suffering from drought on dry, sandy soils. *Ottawa:* Good growth of stalk, but ears not well filled. *Oceana:* Badly injured by drought. *Newaygo:* Suffered severely from drought. *Mecosta:* Nearly destroyed by drought.

INDIANA.—*Scott:* Considerably damaged by chinch-bugs. *Decatur:* Late corn short; chinch-bugs injurious. *Gibson:* Early plantings very good; late, in danger from frost. *Jennings:* Good on dry land, but poor on wet. *Madison:* Average on dry lands. *Morgan:* Improved; short throughout. *Noble:* With a good fall season the crop will be tolerable. *Perry:* Early plantings good. *Warren:* Greatly needs rain. *Cass:* Suffering through lack of rain. *Dubois:* Shortened by dry August. *Hamilton:* Late and liable to frost, but improves as the season advances. *Shelby:* Injured by drought. *Lake:* Full average crop in prospect. *Orange:* Late corn drying up. *Boone:* Will be short. *Brown:* Rapidly brought out by dry, warm August; promises an average. *Crawford:* Will be somewhat injured; early corn mostly made. *Newton:* Early planted corn on high lands will yield 40 bushels per acre. *Wells:* Improved through August. *Clay:* Shortened by drought. *Dearborn:* Shortened by drought. *Marshall:* Short. *Steuben:* Suffered for rain. *Owen:* Shortened by heat and drought.

ILLINOIS.—*Pike:* Light. *Crawford:* Late corn short; injured by grasshoppers.

Morgan: Early plantings good; late plantings poor. *Moultrie:* Shortened one-fourth by drought. *Sangamon:* Little good corn in the county. *Lawrence:* Suffering for rain. *Pope:* Not well worked on account of wet; in many places ruined by chinch-bugs. *Vermilion:* Seriously injured by drought. *Washington:* Shortened by drought: corn being cut for fodder. *Champaign:* Early corn poorly filled; late, a failure from drought. *Jersey:* Assessor reports 30,000 acres in corn which will not average 20 bushels. *Kankakee:* Early planted corn but little over a half crop; late, will make nothing but fodder. *Montgomery:* Shortened by drought in the north part of the county. *Marshall:* Short crop. *De Kalb:* Average. *Effingham:* Decreased acreage; three-fourths average. *Ford:* Less than a half crop probably. *Knox:* Not half a crop. *Ogle:* Shortened by August drought; not filling well. *Rock Island:* Much injured by late planting and drought. *Boone:* Stand deficient. *Lee:* Seriously damaged by drought; ear shrunken. *Winnebago:* Improved rapidly. *Richland:* Mostly out of danger. *Washington:* Did well to the middle of August, since when it was injured by drought. *Dunn:* Shortened by drought. *Piatt:* Poor, and getting worse every week. *Cass:* Two-thirds of a crop. *Mason:* Shortened by drought.

Wisconsin.—*Waukesha:* Suffering from drought. *Dane:* A fair crop in spite of drought. *Walworth:* Corn needs a warm fall. *Portage:* Dent-corn largely ruined by drought. *Crawford:* Below average. *Clark:* Injured by grasshoppers. *Milwaukee:* Does not promise a large yield; weeds got the inside track early in the season, and have held their own.

Minnesota.—*Blue Earth:* Corn not earing very well. *Cottonwood:* Looks fine; will be over average. *Faribault:* Failed to fill on account of drought. *Houston:* Average, though the season was not favorable. *Jackson:* Will be average if frosts delay. *Renville:* Improving. *Jackson:* Good but not plenty. *Wabashaw:* Fine corn-weather.

Iowa.—*Adair:* Mammoth corn from the Department did well. *Crawford:* Considerably damaged by grasshoppers. *Louisa:* Late corn a half crop. *Marion:* Shortened by drought. *Clinton:* Seriously injured by drought; late and almost ruined. *Montgomery:* Shortened by drought. *Polk:* Seriously injured by drought. *Pottawattomie:* Light crop through late planting and subsequent drought. *Buena Vista:* Fine growth, but needs three weeks to mature. *Harrison:* Injured in places by grasshoppers. *Calhoun:* Mostly well eared. *Chickasaw:* Suffered from drought. *Black Hawk:* Suffered from drought. *Fremont:* Shortened one-half by drought. *Jackson:* Shortened by drought. *Audubon:* Shortened by drought. *Ringgold:* Injured by drought. *Grundy:* Will be safe with two weeks more of good weather; crop choice, but less than last year. *Adams:* Shortened by drought. *Jefferson:* Badly damaged by drought. *Mahaska:* Corn-fields drying up. *Mitchell:* Where well attended, corn is excellent, and out of the way of frost. *Madison:* Seriously damaged by drought.

Missouri.—*Clinton:* Much of the late corn never tasseled out, some farmers cutting it for fodder. *Greene:* In some parts burnt up; on good ground and well cultivated it reaches from one-half to three-fourths of a crop. *Cass:* Greatly shortened by drought. *Jackson:* Reduced one-half by drought. *Miller:* Not even a third of a crop, through chinch-bugs and dry weather, some farmers cutting the crop into fodder. *Moniteau:* Late corn almost nothing. *Platte:* One-fourth of a crop. *Wayne:* One-third of a crop. *Polk:* Many fields will not produce five bushels per acre. *Boone:* Half a crop. *Carroll:* Greatly damaged by drought. *Jasper:* Literally drying up. *Adair:* Drying up. *Barton:* Burnt up. *Cape Girardeau:* Suffering from drought and chinch-bugs. *Crawford:* Very good; later crops injured by chinch-bugs. *Holt:* Below average. *Lawrence:* Suffered from drought, chinch-bugs, and grasshoppers. *Ozark:* Injured by drought. *Perry:* Ruined. *Ralls:* Shortened two-thirds by drought. *Nodaway:* Half crop. *Putnam:* Much old corn left. *Worth:* Below average. *Montgomery:* Greatly damaged by grasshoppers. *Phelps:* Much injured by drought. *Pulaski:* Very short. *Grundy:* Fast drying up. *Pemiscot:* Ruined by July drought. *De Kalb:* Shortened one-half by drought. *Benton:* Greatly shortened by drought. *Dallas:* Damaged by drought. *Callaway:* Half crop. *Laclede:* Shortened by drought and chinch-bugs.

Kansas.—*Smith:* Would have been extraordinary but for the grasshoppers, which were very destructive. *Osage:* Ruined by extreme hot weather and drought. *Morris:* Surplus, though shortened by drought. *Greenwood:* Shortened by drought. *Cherokee:* Early crop, average; late, half a crop. *Butler:* Shortened by drought one-third. *Woodson:* Early plantings on bottoms largely destroyed by freshets; late planted, injured by drought; crop far below average. *Shawnee:* Almost two-fifths of a crop. *Ottawa:* Seriously injured by drought. *Dickinson:* Short crop. *Washington:* Injured by heat and drought. *Labette:* Early plantings, average; late plantings, nearly a failure. *Montgomery:* Injured by chinches. *Jefferson:* Half a crop. *Neosho:* Half a crop. *Bourbon:* Good on well-tilled, black soil; a failure on light, neglected land; injured by chinches. *Nemaha:* Suffered greatly from drought. *Miami:* Suffering for rain. *Douglas:* Drying up in some parts. *Doniphan:* In many cases will make nothing but fodder. *Coffey:* Late corn badly damaged; earlier, lighter than was antici-

pated. *Jackson:* Shortened by drought. *Lyon:* Mostly a failure; late planted. *Howard:* Shortened by drought.

NEBRASKA.—*Merrick:* Late planted, but will be 90 per cent. of an average if frost keeps off till October 10. *Richardson:* Light. *Boone:* Damaged somewhat by grasshoppers. *Washington:* Injured by grasshoppers. *Antelope:* Would have been 100 per cent. above average but for grasshoppers. *Burt:* Ruined in some places by grasshoppers. *Nemaha:* Greatly damaged by drought. *Jefferson:* Materially injured by drought.

OREGON.—*Columbia:* Short, but looks well; three weeks late.

DAKOTA.—*Union:* Damaged by grasshoppers.

IDAHO.—*Ada:* Late, but promising; will require four weeks to mature.

UTAH.—*Box Elder:* Has more than recovered from the cold, wet spell of May and June. *Weber:* Very weedy. *Tooele:* Will need no more irrigation, but needs warm weather to mature; Cooly corn a week or ten days later than Utah corn.

COTTON.

The present season can scarcely be deemed quite an average one for cotton; but when we recall the fact that drought, severe rains, windstorms, insects, rust—all these or most of them—are recorded of every crop that is made, it will be seen that seasons worse than the present are almost as numerous as those that are better. Should the autumn prove unusually favorable, an average yield might yet be obtained. The only drawbacks are rains and worms, the former no more destructive than severe droughts of some former years, the latter less so than in some former visitations. While caterpillars have been more abundant than last year, their ravages have been really disastrous or sweeping in few locations. There is more disposition to combat these enemies. Paris green (mixed with flour) has been used experimentally, with some success. Many people hesitate to use it for fear of poisoning, and some have used it to little purpose. These experiments, with this and other remedies, should be perseveringly continued, without any fear of infringing on patents, which can only protect an article containing certain ingredients in fixed proportions. The use of Paris green and flour, for instance, cannot be patented, as these articles have been used by tons for many years for insect extermination. It is worth while to make early, continuous, and even costly endeavor to avoid the loss of forty millions of dollars in cotton eaten by worms in a single year of insect prevalence.

The following statement will show the amount of rain-fall in the season for cultivation, upon which so much depends in cotton-growing:

States.	JUNE.		States.	JULY.	
	Average rain-fall in inches.	Number of stations reported.		Average rain-fall in inches.	Number of stations reported.
North Carolina	3.09	11	North Carolina	3.16	4
South Carolina	4.55	4	South Carolina	4.41	2
Georgia	8.13	7	Georgia	4.52	3
Alabama	7.12	4	Alabama	3.73	3
Mississippi	5.32	3	Mississippi	3.30	1
Louisiana	9.87	3	Louisiana	7.43	1
Florida	9.45	5	Florida	4.41	4
Texas	10.48	7	Texas	5.60	2
Arkansas	7.31	3	Arkansas	5.40	1
Tennessee	6.85	7	Tennessee	2.31	2

The rains of June, the season of most active efforts in keeping clear of grass, were far heavier than in that month of 1872, except in North Carolina. A comparison for July will show more rain in 1872 in all the cotton States except Georgia, Florida, Louisiana, and Texas. The following is the statement for June and July, 1872:

States.	JUNE.		States.	JULY.	
	Average rain-fall in inches.	Number of stations reported.		Average rain-fall in inches.	Number of stations reported.
North Carolina	4.13	16	North Carolina	3.98	13
South Carolina	2.52	3	South Carolina	6.18	4
Georgia	3.07	9	Georgia	3.90	7
Alabama	4.07	4	Alabama	11.15	5
Mississippi	2.84	4	Mississippi	5.42	3
Louisiana	6.69	4	Louisiana	5.88	4
Florida	6.46	6	Florida	5.36	7
Texas	6.23	12	Texas	2.35	11
Arkansas	4.53	6	Arkansas	6.96	5
Tennessee	6.00	11	Tennessee	6.56	11

During August there was also too abundant moisture for the highest condition of the crop. While some deterioration has resulted from this cause, other conditions have generally been favorable; fertilizers have stimulated growth, and labor has been steadier and more reliable than heretofore.

Our June returns of area, when averaged carefully, due weight being given to each return in accordance with the quantity of cotton produced in the county which it represents, indicate scarcely 10 per cent. of increase over the acreage of 1872. The percentage of increase in counties of small cotton area is usually larger than in the principal cotton-producing counties, making an average too high that is obtained simply by dividing the sum of percentages by the number of counties. So, in reports of condition, an average thus made may be too high or too low; the former if the small counties return the best condition, the latter if the large producers are represented by the higher figures. The only accurate expression of the true significance of our returns—and the method which we always intend to employ when great accuracy is desirable, as with the more important crops—is obtained by taking into consideration the quantity usually produced in each county, as well as the simple statement of the status of its crop. This was not done for the June and July reports, owing to the absence of the Statistician, and the reports of area and condition of cotton and other crops are, therefore, slightly inaccurate, in most cases too high, in a few too low, yet the difference is comparatively slight as to the crops whose cultivation is general.

The condition of the crop is higher than in September of last year in Arkansas, the same in Tennessee, and lower in each of the other cotton States. The averages are as follows: Virginia, 98; North Carolina, 95; South Carolina, 86; Georgia, 90; Florida, 85; Alabama, 85; Mississippi, 82; Louisiana, 80; Texas, 92; Arkansas, 93; Tennessee, 92; Missouri, 96.

For the purposes of comparison we give the September statements of condition, as recorded in the monthly reports of the Statistical Division, for the past three years:

States.	1873.	1872.	1871.
North Carolina	95	101	82
South Carolina	86	95	80
Georgia	90	96	78
Florida	85	92	75
Alabama	85	88	80
Mississippi	82	90	80
Louisiana	80	86	77
Texas	92	94	80
Arkansas	93	78	95
Tennessee	92	92	96

Cotton-fields in North Carolina generally make a fine show of vigorous and fruitful plants, the exceptions resulting more from the falling of forms and bolls, in consequence of too abundant rain-fall, than from the presence of worms. In South Carolina similar damage from excessive moisture occurs, and the caterpillars threaten a partial or total destruction of the top crop in several counties. The crop appears better in Georgia than in any other cotton State east of the Mississippi, though there is some injury from rust and heavy rains, and the caterpillar is present in force in many counties, but generally came too late to cause more than a small percentage of loss. The injury from worms and the season's vicissitudes in Florida is somewhat greater, amounting to 15 per cent. of depreciation in condition of crop. Our returns cover nearly two-thirds of the entire area in cotton on the Atlantic sea-board. The caterpillar appeared in portions of Alabama toward the last of July, but its ravages have not been serious until recently, having been held in check to some extent, in certain counties, by the use of poisons, although efforts to combat the pest have not been general. In some counties in Mississippi the plant is shedding leaves and forms from rains, in others from drought. Rust has appeared in some locations, and both caterpillars and boll-worms are doing local damage in shortening the life of the plant, without much injury to the bottom and middle crops.

The crop of Louisiana lacks uniformity, Carroll returning 100 and Caddo 40; Tensas 85 and Rapides 33. In some parishes worms have been present without doing much damage, while losses have been heavy in others. There is a similar range of condition in Texas, from very good to quite poor, though the average is much higher. Worms have appeared in many parts of Arkansas, with little prospect of damage except to the top crop. The average condition of the crop is much higher than in September of last year. Prospects are also good in Tennessee. Several counties in Missouri make returns of cotton which have never before made mention of that crop.

VIRGINIA.—*Prince George:* Rust, but the damage is not extensive. *Greenville:* Cotton will suffer if rains continue. *Surrey:* Better than ever known. *Southampton:* Injured by late rains.

NORTH CAROLINA.—*Lincoln:* Bolling unusually well; prospect flattering. *Robeson:* Looked unusually well up to August 1, since when the continuous rains have caused a shedding of fruit. *Currituck:* Has come out of the grass, and bids fair. *Sampson:* Plants of fair size, but shedding blooms and squares. The new variety of turn and triple-boll cotton that promised so much, has shed more than any other variety. *Mecklenburgh:* Injured by late rains; two weeks of dry weather will bring the crop 10 per cent. above last year's; rust in some places. *Moore:* Looks fine, though late rains have rusted it somewhat. *Chowan:* Much improved, though the late heavy rains are rusting it, and have made it shed to some extent. *Gates:* Rain causing the bolls to drop. *Lenoir:* Casting forms and rusting in some fields. *Gaston:* Good growth and fruitage; some young bolls rotting. *Hertford:* Unusual growth of weed, but the rains will make

many of the later forms to fall off. *Alamance:* Plants large; crop promising. *Bladen:* Falling on account of excessive rains of late. *Edgecombe:* Will be injured by the heavy rains; top crop shedding; boll-worm and rot reported. *Harnett:* Looks very fine where well cultivated. *Cumberland:* Rain prevented the last working of the crop, which is now shedding squares and rotting; loss variously estimated from 25 to 50 per cent. *Granville:* Slightly rusted by rain; crop good. *Pitt:* Excessive rains causing cotton to shed and rust. *Martin:* Injured in fruiting at least 30 per cent. by rains. *Rowan:* Considerably injured by rain. *Newberry:* Rain caused cotton to shed. *Franklin:* Rather too wet for cotton. *Bertie:* Rain caused shedding; growth the finest in many years; some rust. *Tyrrell:* Rains, August 10, damaged the crop, causing it to shed greatly. *Camden:* Shed badly from rain, and beginning to rust. *Beaufort:* A promising crop, injured by late rains. *Greene:* Rain shortened the season fifteen or twenty days, causing the late forms to drop, and producing rust. *Onslow:* Failed on account of rains. *Perquimons:* Crop abandoned on account of wet, cold, and lice. *Anson:* Badly rusted. *Stanly:* One of the finest crops ever known here. *Polk:* Rust has appeared in several localities.

South Carolina.—*Orangeburgh:* Rusted; the rain threatens to reduce the yield; caterpillars at work, but the crop is too far advanced for much injury from them. *Clarendon:* Injured by excessive rain; rust and casting of fruit very general. *Fairfield:* Increased acreage lost by lack of working; much upland cotton has taken a new growth and will be too late for fruiting. *Chesterfield:* Reduced 10 per cent. by excessive rain, causing an extensive shedding of bolls. *Marion:* Too wet for cotton; rusted on thin lands; on highly-manured lands the bolls rot as they mature. *Lexington:* Excessive rain causes too much weed and shedding of young bolls; seed from the Department show a marked superiority. *Richland:* Caterpillars all over the county; damage not yet developed. *Williamsburgh:* Much injured by rains; forms falling; caterpillars destructive. *York:* Excessive August rains caused much casting of fruit; crop declining from its first high condition. *Marlborough:* Heavy rains have brought rust and shedding of forms in sandy lands; worms destructive on bottom-lands. *Laurens:* Opened three weeks late; large growth tending to shed; worms and rot developed. *Union:* Acreage somewhat increased: more commercial fertilizers than usual; short of labor. *Edgefield:* Injured 10 per cent. byrust; due to guano.

Georgia.—*Lincoln:* Prospect never better; weed sufficiently large and well-fruited. *Taylor:* Rusting on sandy lands; little fruit and too much weed. *Richmond:* Injured by drought, but has grown rapidly since August: since then the frequent rains have caused the fruit to drop on bottom-lands; on gray and damp lands the crop is rusting badly. *Liberty:* Caterpillars reported, but have done but little damage. *Worth:* Too much rain for cotton; caterpillars successfully treated with poison; pretty good crop. *Carroll:* Shed forms badly; rusted to some extent. *Gordon:* Beginning to open; promises a large yield. *Schley:* Blooms falling; caterpillar injurious in some places. *Gwinnett:* Ten days later than last year; "Peeler" cotton from the Department is large, well-bolled, and promising, but it seems to be a late variety. *Dooly:* Ruined by rain and rust. *Upson:* Complaints of boll-worms on wet lands where the cotton-weed is heavy; crops average better than for several years. *Clinch:* Crop will be fine if the weather continues favorable. *Muscogee:* Weed of good size but too late in fruiting; some complaint of rust and caterpillar. *Early:* Greatly denuded of foliage by caterpillars, yet the crop will be a third greater than last year. *Wilkinson:* Caterpillars destroying late cotton. *Macon:* Weed above average size; fruitage good, with proper cultivation; only 10 per cent. worked into good condition on account of rain. *Calhoun:* Half the crop eaten by caterpillars. *Coweta:* Severely injured by drought, boll-worms, and caterpillars. *Glynn:* But little injured by either rains or caterpillars. *Baldwin:* Worms in a few fields. *Brooks:* Damaged 10 per cent. by caterpillars, rust, and shedding. *Twiggs:* Crops late, poorly fruited, and infested to some extent with caterpillars and boll-worms, besides some rust. *Wilkes:* Hot weather, causing cotton to fail rapidly. *Marion:* Boll-worm and caterpillar are ravaging the crop, especially in the fresh low lands. *Walton:* Drought telling heavily on the crop. *Lee:* Caterpillar destroyed only a few crops, but dry weather is shortening all. *Jackson:* Looks well; would yield heavily but for the grass in it; many acres abandoned on account of rain and grass. *Decatur:* Further growth arrested by caterpillars. *Jefferson:* Too wet season; rust and worms destructive. *Heard:* Best prospect for a crop since the war. *Stewart:* A third short through excessive rains, boll-worms, and caterpillars. *Whitfield:* Good. *Franklin:* Prospect reduced. *Madison:* Fertilizers reely used. *Chattooga:* Some rust.

Florida.—*Liberty:* Injured by caterpillars; Paris green fails to meet the case; some say it kills the cotton as well as the insect. *Madison:* Seriously damaged by excessive rains and by insects; some say the cost of exterminators is greater than the ravages of insects. *Jefferson:* Greatly injured by caterpillars. *Taylor:* Rain caused cotton to shed. *Hillsborough:* Better than ever; average increased. *Leon:* Suffered from rain and caterpillars; half the crop eaten up. *Columbia:* Caterpillars have done but little mischief except in a few localities. The sea-island seed from Charleston fruited

well but netted badly. *Manatee:* Peleer cotton from the Department doing well. *Gadsden:* Where not denuded by caterpillars the plant tended to large fruitage, but many of the young forms were lost by excessive shedding; caterpillars are very general and destructive; weed unusually small on old lands in spite of fertilizers, but rank on new lands; bolls here rotting for lack of sunshine. *Levy:* Badly rusted. *Gadsden:* At the last meeting of our agricultural society it was the unanimous opinion of the members that all the commercial fertilizers used—of which there was quite a variety—had been a material injury to the crop, causing it to *fire,* and adding nothing to the size of the plant or to the production of fruit.

ALABAMA.—*Jackson:* Cotton brought out rapidly by dry weather in July and August. *Greene:* Cotton-worms appeared July 26, but little damage as yet; crop greatly improved. *Choctaw:* Cotton caterpillars at work; farmers hesitate about using poison. *Saint Clair:* Fine. *Lee:* Weed fine; in some places excessive rains have caused the plants to shed. *Hale:* Crop stripped by caterpillars almost as much as last year. *Barbour:* Seriously injured by caterpillars, especially on bottom-lands, where the crop lately promised so well. *Henry:* Crop fine, but caterpillars have appeared in immense numbers; a few are using poisons, with temporary success. *Clarke:* Crop fine; third crop of caterpillars are sweeping the leaves; poison is used to some extent. *Macon:* Crop seriously injured by caterpillars; but little matured cotton as yet; boll-worm also doing much damage; planters generally think the crop a failure. *Crenshaw:* Cotton-worms appeared August 20; crop average with last year; cotton-seed from the Department doing well. *Pike:* Crop very promising ten days ago, but is now being eaten by caterpillars; another week will finish it; large tracts will not make a bale to the hundred acres. *Blount:* Entirely healthy; free from insect enemies and well developed. *Coffee:* Crop never better, but the caterpillars have just appeared. *Geneva:* Very good. *Chambers:* With a good season hereafter the crop will be large; caterpillars doing but little damage, as the crop is later than usual. *Franklin:* Prospects improved; never had any caterpillars here. *Montgomery:* Blooms swept by caterpillars to some extent. *Butler:* Crop two or three weeks later than last year in fruiting, but would have done finely if the army-worm had not appeared; in spite of Paris green they will probably strip the crop. *Calhoun:* Above average. *Autaga:* Almost ruined by worms; estimates vary from one-fourth to one-third of a crop; average on manured lands. *Perry:* Stripped by bugs; gloomy prospect. *Marshall:* Rust in cotton; no general apprehension yet. *Dallas:* Caterpillars destroyed half the crop. In some cases an early application of a patented preparation of Paris green saved the crop. *Marengo:* Cotton has fallen off distressingly; worms have eaten the leaves; the bolls dropping off or opening prematurely. *Clark:* Bottom crop good; top crop eaten by worms. *Madison:* Prospect declining; dry-rot and worms. *Lauderdale:* Prospect reduced by bad weather.

MISSISSIPPI.—*Grenada:* Shedding through dry weather; where better weather exists the crop will be average; a large proportion of it badly cultivated; the character of the season imposed double labor on the crop. *Warren:* Caterpillars increasing; forms and bolls shedding on uplands. *Marion:* Third crop of caterpillars appearing; poisons in demand, but their efficacy as yet untested. *Yalabusha:* Beginning to open and doing well. *Amite:* Suffered from excessive rains. *Jasper:* Cotton making fast; two weeks late, and eaten by caterpillars. *Wilkinson:* Rotted by rain; caterpillars numerous; but little damage yet; plants shedding heavily. *Altala:* Coming to an average; well worked crops are good. *Tishemingo:* Fine cotton weather; greatly improved. *Kemper:* Injured by rust on uplands and by worms on low lands. *Lowndes:* Promising till caterpillars and boll-worms appeared; great destruction of young bolls; nearly all the fields are stripped of leaves. *Lee:* Lowlands will yield a bale per acre; highlands about one-fifth as much. *Washington:* Two weeks late; stalk large and well bolled, but the worms are destroying the foliage in many cases. *De Soto:* Cotton rapidly failing. *Le Flore:* Peeler cotton fine. *Winslow:* Bottom crops about gone up through rain. *Noxubee:* Damaged 25 per cent. by leaf and boll-worms. *Rankin:* Improved 10 per cent. Caterpillar and boll-worm did but little damage; part of the crop as good as ever made; the remainder almost a failure. *Holmes:* Shedding badly on account of rain. *Jefferson:* Shortened by worms and storms; much lying flat. *Tensas:* Greatly injured by worms, and still more by the "blade-rot," especially early cotton on sandy lands.

LOUISIANA.—*East Baton Rouge:* Crops not abandoned are now doing well; plants of fine size and color, but at least three weeks late; a favorable fall will make a half crop; worms have appeared in isolated localities. *Avoyelles:* Crop backward, and now being eaten by caterpillars; many using Paris green; if this remedy does not succeed there will not be a leaf left in the next ten days. *Saint Mary's:* Too wet for cotton. *Terre Bonne:* Unprecedented rain-fall, destructive to cotton. *Franklin:* Large and well bolled; some boll-rot; some worms but no damage yet; with no disaster the crop will be large. *Cameron:* Better than was expected; worms not so injurious as they threatened to be a month ago. *Richland:* Worms have appeared but have done little damage. *Caddo:* Half destroyed by worms. *Iberia:* Worms spreading; not even two-thirds of a crop

Madison: Good condition and opening fast; cotton-worms in all parts of the parish, but too late to do much damage. *Union:* Cotton-caterpillar at work generally; but little damage yet. *Carroll:* Very fine where well cultivated, but the rot and caterpillars are at work reducing it to the average of last year. *Rapides:* Stripped clean of its foliage by August 20; three weeks late; wet weather threatens to rot the bolls. *Bossier:* Some crops on Red River have not a leaf left; a few on the hills badly worm-eaten. *Washington:* Looks well. *Tangipahoa:* Greater part of the crop destroyed by worms.

Texas.—*Anderson:* Injured 10 per cent. by caterpillars, but improved by fine weather. *Hill:* Fine. *Hunt:* greatly improved. *Lamar:* A half crop. *Washington:* Stripped by caterpillars; poison somewhat effectual. *Upshur:* Equal to last year; will be better if the season continues favorable; some rumors of boll-worms and caterpillars. *Red River:* Cotton saved from grass and weeds is growing finely and promises well. *Wood:* Some damage by worms. *Polk:* Taken by worms; rich bottom-lands will make three-fourths of a crop. *Navarro:* Will be large if not eaten by worms. *Coryell:* Better than ever before; no worms. *Montgomery:* Great efforts to kill worms; will save half the crop. *Ellis:* Better than was expected. *Caldwell:* Worms appeared, but no damage yet. *Leon:* Looks full average, but worms are in every field. *Dallas:* Never better prospect; promises of 500 pounds of lint per acre. *Wharton:* Stripped by caterpillars; nearly a total failure. *Collin:* Favorable weather bringing the crop to average. *Burnet:* Recovering; may be full average. *Lavaca:* Too wet for cotton; what escaped worms was so rank that the undergrowth rotted; late plantings all eaten by worms; a patented preparation of Paris green somewhat successful. *Rusk:* Large weeds; ravaged by boll-worms and army-worms. *Blanco:* Worms only in isolated fields. *Comal:* Crop flattering in spite of drawbacks. *Austin:* Greatly injured by worms; showers have stimulated the growth of weeds without corresponding fruitage; bottom-fields entirely stripped; uplands less severely affected. *Bexar:* Remarkably fine. *Cooke:* Short. *Limestone:* Large and beyond danger, but labor scarce to gather the crop. *Grimes:* Worms have taken the crop; some effect from arsenic and Paris green. *Liberty:* Worms destroying the crop. *Smith:* Worms destructive on red land, but not on gray land. *Fort Bend:* Shortened by worms and rains.

Arkansas.—*Arkansas:* Looking fine. *Union:* Worms have appeared; crop in advance of last year; weeds larger and bolls more numerous. *Saint Francis:* Injured by drought. *Hempstead:* Improved, but worms are reported. *Monroe:* Bottom and middle crops scarce, with good prospects for top crops. *Baxter:* Shortened by drought. *Prairie:* Greatly improved. *Dorsey:* Fine cotton scarce; caterpillars have appeared, but have not done much damage. *Columbia:* Still growing and blooming, three weeks late. *Crittenden:* The fine season is bringing cotton up to average, though there is some danger from frost. *Independence:* Greatly improved by late rains. *Sebastian:* Shortened by drought. *Yell:* Variant estimates of the crop; late cotton looking remarkably well. *Montgomery:* Much cotton abandoned to grass, but a larger acreage was planted; the fine weather brings it out. *Drew:* Drought injurious; some caterpillars. *Pulaski:* Injured by drought. *Ashley:* Worms increasing; leaves already stripped.

Tennessee.—*Fayette:* Crops improved. *Decatur:* Crop three-fourths of an average. *Roane:* Seed from the Department doing splendidly; plants 4 or 5 feet high, promising a heavy yield. *Albion:* Good. *Giles:* Not over half average. *Haywood:* Drought following heavy June rains caused a dropping of forms and a stinting of growth; fields imperfectly worked and the grass gaining ground. *Putnam:* Yield and quality both improved; crop prospects fair. *Shelby:* Somewhat improved. *Hancock:* Upland cotton from the Department is full of bolls, and 50 per cent. larger than any other cotton.

Missouri.—*Pemiscot:* Improved greatly in thirty days; cotton culture increasing.

Kansas.—*Labette:* Doing finely; fully equal to any of the northern range of cotton States.

OATS.

The general average of condition of the oats crop is 92. The crop is above average—in Vermont, 100; Virginia, 103; North Carolina, 102; South Carolina, 105; Georgia, 108; Alabama, 107; Texas, 100; Arkansas, 105; Tennessee, 105; West Virginia, 105; Kentucky, 100; Minnesota, 101; Oregon, 110. In all the New England States except Vermont, and in the Middle States, the crop is under average, the deficit ranging from 26 per cent. in New Jersey to 3 per cent. in New York. In portions of these States a severe drought prevailed during the latter part of the growing season, greatly depreciating the yield. In other localities the

crop was injured by rain, producing rust and wetting the grain after cutting. In all the Atlantic coast and Gulf States the crop was above average, except Maryland, 92; Florida, 98; Mississippi, 99; and Louisiana, 96. In some portions of Louisiana the crop was prostrated by storms, thus reducing the yield, which otherwise would have been full average. The Southern inland States are all above average. In all the Northwestern States, except Minnesota, the crop was below average, the growth of the grain being unfavorably affected by the drought in many places and by heavy storms in others. West of the Mississippi the ravages of grasshoppers were very serious in this crop. Nebraska, where those ravages were especially severe, reports a crop 27 per cent. below average. On the Pacific coast California was 6 per cent. below, and Oregon 10 per cent. above average. The Schonen was the most prolific variety in Baltimore County, Maryland, where it is esteemed as a great acquisition to the farming interest. In Cape Girardeau County, Missouri, this variety grew remarkably well, but was prostrated by storms. In Curry County, Oregon, the growth was 9 feet, very thick on the ground and well filled. The potato-oats are variously reported. In Beaufort County, North Carolina, they failed entirely; in Polk and Haywood they did moderately well. In Jasper County, Mississippi, they were worthless, while in the parish of East Baton Rouge, Louisiana, they grew finely, till prostrated by storms.. In Burnet County they partook of the general failure of the crop. In Hardin County, Ohio, they were affected with both rust and smut. In Morgan County, Indiana, they were three weeks later than the native varieties. In Ogle County, Illinois, they yielded 16-fold. In Smith County, Kansas, a gallon of seed produced 5 bushels. Honorable mention is also made of the Excelsior variety at several points.

VERMONT.—*Grand Isle:* Grain filled out well.

NEW HAMPSHIRE.—*Hillsborough:* Shortened by drought.

MASSACHUSETTS.—*Norfolk:* Standard quality.

NEW YORK.—*Washington:* Almost a failure. *Steuben:* Crop improved. *Chemung:* Injured by rain in harvest. *Tioga:* Suffered from wet. *Wyoming:* Greatly improved. *Otsego:* Injured by drought in June and a wet harvest. *Erie:* Late sown better than the early sown, on account of drought.

NEW JERSEY.—*Warren:* Good yield, but sometimes short-strawed. *Cumberland:* Injured by drought.

PENNSYLVANIA.—*Northampton:* Better than was expected after the severe drought, *Clearfield:* Damaged by wet weather. *Armstrong:* Extra growth of late oats. *Indiana:* Damaged by storms in August. *Tioga:* Much injured by wet. *Greene:* Injured by wet. *Warren:* Rusted during the hot, wet days of the middle of August.

MARYLAND.—*Baltimore:* Norway and other late varieties injured by heavy rains; early varieties well secured; Schonen a great acquisition, the most prolific variety here. *Howard:* Usually poor; poorer than ever if possible. *Cecil:* Quantity below average; weight rather above.

VIRGINIA.—*Bedford:* Crop fine. *Patrick:* Better than last year. *Amelia:* Lodged badly. *Shenandoah:* Very fine quality. *Campbell:* Very fine. *Spottsylvania:* Best crop for many years. *Warren:* Promise above average in spite of chinch-bugs. *King and Queen:* Much better than last year; better season. *Highland:* Good. *Prince George:* Above average.

NORTH CAROLINA.—*Chowan:* Better than usual; full crop. *Edgecombe:* Above average. *Beaufort:* Potato-oats a failure. *York:* Winter crop a failure; spring sowings up to average. *Perquimans:* Unfavorable seasons for ten years; not a paying crop. *Polk:* Four quarts of potato-oats from the Department yielded 1¾ bushels. *Haywood:* Potato-oats grew finely, but it is doubtful whether they will compare with the native oats in weight.

SOUTH CAROLINA.—*Fairfield:* Spring sowing better than for several years.

FLORIDA.—*Wakulla:* Crop good, but half spoiled after cutting by rain.

GEORGIA.—*Merriwether:* Many say the oat crop is the best ever raised here. *Decatur:* Injured by rain in harvest. *Jackson:* Remarkably good.

ALABAMA.—*Blount:* Crop extra; Excelsior and potato-oats did well. *Coffee:* Good. *Geneva:* Exceedingly good. *Montgomery:* Good.

MISSISSIPPI.—*Jasper:* Potato-oats worthless.

LOUISIANA.—*East Baton Rouge:* Potato-oats did finely, but were prostrated by storms when in milk and ruined.

TEXAS.—*Red River:* Large acreage and heavy yield. *Polk:* Very small acreage; Canada oats yield 100 per cent. more than any other. *Dallas:* Red rust-proof oats yield from 60 to 75 bushels per acre. *Burnet:* Nearly a failure; potato-oats from the Department did not return the seed. *Marion:* Uncommonly fine. *Rusk:* Above average. *Montgomery:* Red or "anti-rust" oats have done well; common kinds rusted by spring rains.

TENNESSEE.—*Greene:* Fine crop. *Roane:* Very good. *Monroe:* Best crop for several years.

WEST VIRGINIA.—*Hardy:* Injured by rain in the stack. *Mercer:* Very good. *Mineral:* Considerably injured by wet. *Tucker:* Better than for twenty years. *Brook:* sprouting in the stack. *Grant:* Very good, though sometimes harvested in bad condition.

KENTUCKY.—*Lincoln:* Injured by storms. *Anderson:* About average. *Lewis:* Full and heavy. *Fayette:* Light.

OHIO.—*Coshocton:* Better than was expected. *Washington:* Late and injured by storms. *Hardin:* Potato-oats rusty and smutty; not equal to the New Brunswick. *Stark:* Injured by rust. *Licking:* The Birlie oats did not fill. *Greene:* Generally good grain but short crop.

MICHIGAN.—*Gratiot:* Remarkably heavy. *Montcalm:* Largest yield for many years. *Lapeer:* Full average, and well filled. *Hillsdale:* Shortened by June drought. *Jackson:* Short but well filled. *Newaygo:* A little over average. *Shiawassee:* Average.

INDIANA.—*Jennings:* Very good. *Morgan:* Potato-oats three weeks later than the native varieties. *Perry:* Injured by rain. *Lake;* Fair and well secured; grain very bright and nice. *Newton:* Yield 15 to 20 bushels per acre; ordinary average 40 to 60. *Harrison:* Promised well, but were badly injured by heavy storms of rain and winds. *Brown:* Yield light. *De Kalb:* Short but good.

ILLINOIS.—*Morgan:* Badly blown down; did not fill well; light yield. *Clinton:* Largely destroyed by drought, storms, and bugs. *Boone:* Not over three-fourths average; rusted. *Winnebago:* Do not yield as well as was expected. *Wayne:* Blown down by storms. *Mason:* Good yield and quality. *Cass:* Light. *Ogle:* Decreased area; crops well secured; potato-oats from the Department yielded 2 bushels from four quarts of seed.

MINNESOTA.—*Goodhue:* Good.

IOWA.—*Lamar:* Below average. *Woodbine:* Potato-oats from the Department destroyed by grasshoppers. *Benton:* Yield increased by fine weather. *Jackson:* Light.

MISSOURI.—*Washington:* Good crop. *Platte:* Saved in good condition. *Newton:* Half a crop. *Cape Girardeau:* Nearly ruined by winds. *Ralls:* Very fine and well harvested. *Cape Girardeau:* White Schonen and Excelsior grew well, but were so badly blown down that they could not be reaped. *Grundy:* Potato-oats a success.

KANSAS.—*Smith:* A gallon of potato-oats from the Department yielded five bushels. *Ellsworth:* Potato-oats did well.

NEBRASKA.—*Boone:* Stacked in good condition. *Washington:* In many places an entire failure; badly eaten by grasshoppers. *Burt:* Injured by grasshoppers. *Gage:* Somewhat injured by chinch-bugs. *Dixon:* Badly damaged by grasshoppers.

OREGON.—*Curry:* White Schonen oats from the Department (second crop from seed) grew 9 feet high, very thick; filled enormously, heads long and heavy; best variety grown here. *Clackamas:* Never better. *Grant:* Cropfrom 40 to 50 bushels per acre. *Polk:* Yield splendid.

DAKOTA.—*Clay:* Late oats destroyed by grasshoppers. *Union:* Damaged by grasshoppers. *Lincoln:* Seriously damaged by grasshoppers. *Minnehaha:* Small yield, but good quality. *Hanson:* Affected by grasshoppers.

MONTANA.—*Lewis and Clarke:* Badly damaged by grasshoppers; many fields will not be harvested.

NEW MEXICO.—*Mora:* No oats yet harvested except in irrigated land.

UTAH.—*Boxelder:* Harvest abundant; grain plump and fine.

RYE.

Rye averaged in Rhode Island, 101; Connecticut, 102; Maryland, 102; Mississippi, 100; Minnesota, 100; Kansas, 102; Nebraska, 104; and Oregon, 103; in New Jersey, 97; Pennsylvania, 99; Arkansas, 99; Ohio, 99; Michigan, 98; Wisconsin, 99; Iowa, 99; and California, 97. Of the remaining States the lowest average, 84, was in Kentucky and North Carolina. The following notes, selected from our regular correspondence, will give some idea of its local status—Delaware and Louisiana made no report of this crop:

CONNECTICUT.—*Hartford:* Unusually bright and fine.
PENNSYLVANIA.—*Northampton:* Looks well. *Indiana:* Good quality and condition.
NEW YORK.—*Chemung:* Injured by rain in harvest. *Albany:* Good and well secured.
MARYLAND.—*Baltimore:* Secured in good order.
VIRGINIA.—*Floyd:* Winter rye from Department yields twenty-fold.
ALABAMA.—*Coffee:* Crop good.
TEXAS.—*Burnet:* Nearly a failure. *Rusk:* Large yield.
WEST VIRGINIA.—*Mercer:* Badly injured by the midge. *Monongolia:* Very poor.
KENTUCKY.—*Lincoln:* Not good. *Anderson:* About average.
ILLINOIS.—*De Kalb:* Fair. *Ogle:* Short but good; seed from the Department very satisfactory. *Boone:* Very poor.
IOWA.—*Tama:* Below average.
MISSOURI.—*Platte:* Saved in good condition; 75 cents per bushel.
NEBRASKA.—*Richardson:* Good quality and condition.

BARLEY.

Barley was harvested in an average condition in West Virginia, 100; and above average in Oregon, 106. In New England it ranged from 82 in Rhode Island to 96 in Massachusetts. In New York and Pennsylvania it averaged 90, and in Maryland 93. All the South Atlantic and Gulf coast States were below average, the deficit varying from 18 per cent. in Alabama to 2 per cent. in Texas. The inland Southern States varied from 90 per cent. of an average in Kentucky to full average in West Virginia. The Northwestern States ranged from 81 in Iowa to 99 in Wisconsin. California averages 92.

NEW YORK.—*Steuben:* Injured by rain. *Chemung:* Injured by rain in harvest. *Yates:* Rain in harvest.
PENNSYLVANIA.—*Northampton:* Crop worthless through drought.
CALIFORNIA.—*Monterey:* Late-sown barley a failure; generally of good quality; crop two-thirds of last year's. *Sonoma:* Excellent condition.

POTATOES.

The average condition of this crop for all the States is 95. It is below average in all the New England States, the deficit ranging from 25 per cent. in Rhode Island to 2 per cent. in New Hampshire. In those localities affected by the drought of the latter part of summer the late plantings were very short, but at several points in Massachusetts and Rhode Island the later crops are better than the earlier ones. In the Middle States, New York is above average, while New Jersey, Pennsylvania, and Delaware are below. In several counties excessive rains rotted the crop; in others the Colorado beetle was destructive, especially in Westmoreland, Beaver, Indiana, and Lawrence County, Pennsylvania. Maryland averaged 95; Virginia 98; North Carolina 96. In South Carolina and the Gulf States the crop was average, or above, except in Louisiana and Texas. In Franklin Parish, Louisiana, it is observed that potatoes yield bountifully when proper culture has been bestowed upon them. In some counties in Texas they were injured by frost. The crop is below average in all the inland Southern States, the Colorado beetle being reported in several counties of Tennessee, West Virginia, and Kentucky. Insect injuries and unfavorable conditions of growth greatly affected the crop in many portions of the Northwest and on the Pacific coast, reducing the yield below an average. The Colorado beetle was successfully resisted in many counties by the prompt administration of Paris green and other remedies, in the use of which farmers, by experience, have acquired greater skill. In the Northern Trans-Mississippi Territories the grasshopper is reported as devouring this with other crops. In several of our reports

it is noted that Peachblow and Early Rose potatoes escaped the ravages of insects and withstood the stress of drought to a greater extent than other varieties.

MAINE.—*Waldo:* Suffering for rain. *Aroostook:* Early potatoes good and out of the way of frost. *Oxford:* Quality excellent; fair yield. *Franklin:* Suffered severely from drought.

NEW HAMPSHIRE.—*Grafton:* Early plantings look well. *Strafford:* Shortened by drought 15 per cent.

VERMONT.—*Rutland:* Promising. *Franklin:* Above average. *Grand Isle:* Greatly improved of late. *Chittenden:* First-rate.

MASSACHUSETTS.—*Norfolk:* Late varieties above average.

RHODE ISLAND.—*Washington:* Early planted nearly a failure; late a fair average.

CONNECTICUT.—*New London:* Good. *Hartford:* Never better.

NEW YORK.—*Tioga:* Rotting from wet, especially on clay or loam soil. *Kings:* Good paying crop; mostly Early Rose.

NEW JERSEY.—*Camden:* Nearly all rotted. *Burlington:* Rotted badly in low lands. *Essex:* Early plantings short; later greatly improved by the abundant rains of August.

PENNSYLVANIA.—*Northampton:* Will be a good crop if not rotted by heavy rains. *Chester:* Early plantings a light crop, with some rot; later plantings still growing with heavy tops, but are beginning to rot. *Northumberland:* Greatly improved by late rains. *Westmoreland:* Eaten by bugs. *Beaver:* Bugs destructive. *Armstrong:* Beginning to rot. *Indiana:* Late plantings swept by bugs. *Elk:* Light crop; some rot reported; bugs present, but did little damage. *Huntingdon:* Colorado beetle present, but did little yamage. *Lawrence:* Badly used up by Colorado beetles.

DELAWARE.—*Kent:* Short crop.

MARYLAND.—*Frederick:* Prospect never better. *Washington:* Weather favorable for potatoes. *Carroll:* Some rot reported. *Cecil:* Early below average; late promise well.

VIRGINIA.—*Warwick:* Benefited by late rains. *Henrico:* Early planting failed to come up; later plantings are not maturing well. *Spottsylvania:* Late plantings good. *Buchanan:* Greatly injured by rot. *Highland:* Doing well.

NORTH CAROLINA.—*Davidson:* Crop shortened by spring frosts and drought.

FLORIDA.—*Orange:* Fine weather for potatoes.

ALABAMA.—*Blount:* Best crop in ten years.

LOUISIANA.—*Franklin:* Potatoes yield bountifully with proper cultivation.

TEXAS.—*Victoria:* Killed by late frosts. *Corell:* Almost a total failure.

TENNESSEE.—*Bedford:* Crop short. *Coffee:* Late potatoes destroyed by bugs. *De Kalb:* Crop magnificent. *Monroe:* Splendid.

WEST VIRGINIA.—*Jefferson:* Colorado beetles at work. *Brooke:* Doing well. *Tyler:* Some fields injured by bugs; adjoining fields retarded. *Nicholas:* Some injury from bugs; Early Rose and Peachblow escaped.

KENTCUKY.—*Jefferson:* Late varieties injured by the Colorado beetle; Early Rose doing well. *Shelby:* Some fields failed through spring drought. *Scoto:* Colorado beetles made their first appearance, doing but little damage.

OHIO.—*Coshocton:* Full crop; bugs defeated. *Washington:* Small acreage and mostly bug-eaten. *Lucas:* A sort of blight or rot, injuring some fields; Colorado beetles have done but little damage.

MICHIGAN.—*Calhoun:* Early plantings successful; worms successfully resisted with Paris green. *Lapeer:* Best crop for many years; bug successfully resisted. *Jackson:* Promising; bugs gave same trouble, but destroyed only a few crops. *Van Buren:* Potato-bug injurious. *Mecosta:* Late potatoes nearly destroyed by drought. *Newaygo:* Have suffered severely from drought. *Oceana:* Badly injured by drought. *Manistee:* Shortened by drought. *Shiawassee:* Coming in well in spite of bugs.

INDIANA.—*Scott:* Late plantings destroyed by drought and bugs. *Decatur:* Cut short one-half by bugs. *Gibson:* Early Rose good. *Perry:* Good; early plantings fine. *Warren:* Very late; bugs plentier than ever. *Cass:* In many places ruined by Colorado beetles. *Hamilton:* Shortened by drought. *Crawford:* Late potatoes almost a failure. *Harrison:* Early Rose good; late potatoes almost a failure through drought and Colorado beetles. *Clay:* Dry weather and bugs greatly injured the crop. *Dearborn:* Peachblows an entire failure. *Marshall:* Shortened by drought. *Steuben:* Shortened by drought. *Owen:* Prematurely ripened by drought.

ILLINOIS.—*Pike:* Almost a failure from drought. *Morgan:* Early plantings fair; late poor; some bugs. *Moultrie:* Short. *Sangamon:* Injured by bugs and dry weather. *Pope:* Injured by bugs, but recovering. *Putnam:* Partial failure through drought and bugs. *Carroll:* Seriously injured by drought and bugs. *De Kalb:* Under average. *Rock Island:* Nearly a failure through drought and bugs. *Lee:* About finished by rought and bugs. *Mason:* Almost a failure through drought. *Cass:* Potatoes small.

WISCONSIN.—*Chippewa:* Bugs very plenty. *Waukesha:* Suffered from drought. *Dane:* Reduced acreage; best yield for several years. *Pierce:* Much destruction by bugs. *Portage:* Peachblows, no crop; early kinds pretty good. *Milwaukee:* Good, but shortened by bugs. *Douglas:* Numerous, but late in appearing.

MINNESOTA.—*Blue Earth:* Poor through drought. *Winona:* Potatoes have not grown for six weeks on account of drought. *Sherburne:* Will be average in spite of bugs. *Nicollet:* Shortened by drought. *Stearns:* Injured by bugs.

IOWA.—*Crawford:* Injured by grasshoppers. *Louisa:* Shortened by drought. *Woodbury:* A fourth of a crop; cut short by grasshoppers. *Benton:* Injured by drought. *Calhoun:* Late potatoes, few and small. *Chickasaw:* Suffered from drought. *Marion:* Late potatoes shortened by drought. *Clinton:* Reduced three-fourths by bugs and drought. *Black Hawk:* Suffered from drought. *Montgomery:* Injured by drought. *Story:* Injured by drought 20 per cent. *Fremont:* Late potatoes only one-tenth of a crop on account of drought. *Polk:* Shortened by drought. *Pottawattomie:* Very light crop; injured by potato-bugs and grasshoppers. *Audubon:* Shortened by drought. *Ringgold:* Injured by drought. *Mitchell:* Excellent. *Jefferson:* Badly damaged by drought. *Johnson:* Shortened one-half by drought. *Madison:* Damaged by drought.

MISSOURI.—*Harrison:* Late potatoes a failure. *Saint Clair:* Late potatoes almost a failure through drought. *Boone:* Only early varieties escaped drought and bugs. *Jasper:* Late potatoes suffering for rain. *Barton:* Burnt up. *Nodaway:* Nearly ruined. *Phelps:* Late potatoes nothing. *Jefferson:* Badly damaged by drought. *Johnson:* Shortened one-half by drought. *Grundy:* No late potatoes.

KANSAS.—*Wabaunsee:* A total failure in the eastern part of the county. *Douglas:* Need rain speedily. *Miami:* Late crops perishing for rain. *Jefferson:* Early potatoes good; late ones will be a failure without rain. *Washington:* Early potatoes almost a failure; late rains make late ones more promising. *Dickinson:* Short crop. *Ottawa:* Colorado beetles very injurious. *Shawanee:* Late potatoes very poor. *Greenwood:* Late plantings will be benefited by late rains. *Morris:* Small and scarce; worth 75 cents per bushel. *Osage:* Nearly ruined by drought. *Coffee:* Late potatoes suffering for rain. *Jackson:* Poor crop, though Early Rose did well.

NEBRASKA.—*Nemaha:* Peachblows would do finely with rain; all others failures. *Cass:* Will be a failure without speedy rain. *Boone:* Damaged by grasshoppers. *Thayer:* Destroyed by bugs.

CALIFORNIA.—*Sonoma:* Large and good crop; prices low.

OREGON.—*Tillamook:* Potatoes still failing. *Columbia:* Almost ruined by rot.

DAKOTA.—*Clair:* Late potatoes destroyed by grasshopper.

SWEET POTATOES.

This crop is not cultivated in New England, and to only a limited extent in the Middle States. A few counties reported in Maryland give average of 90; all the other South Atlantic and Gulf States are above average except South Carolina 99 and Louisiana 95. Georgia is 8 per cent. above average, fifty counties being embraced. Tennessee, West Virginia, and Oregon, are average, or slightly above. All the other States are below, Missouri, the lowest, being 75.

ALABAMA.—*Blount:* Promise an extra crop. *Coffee:* Never better. *Geneva:* Good. *Montgomery:* Good.

VIRGINIA.—*Chesterfield:* Very fine. *Northampton:* Very fine.

NORTH CAROLINA.—*Gaston:* Rain causes a large growth of vines with a small growth of roots. *Cumberland:* Prospect very good. *Bertie:* Very fine.

FLORIDA.—*Wakulla:* Promising. *Jackson:* Yield large.

MISSOURI.—*Phelps:* Will make nothing at all.

TEXAS.—*Coryell:* Extra fine. *Dallas:* Very promising. *Austin:* Fine, fifty per cent better than last year,

TENNESSEE.—*Loudon:* Running to vine.

HAY AND PASTURES.

The product of hay, including all kinds, in most of the States shows an increase over the previous year ranging from 2 per cent. in Kentucky and Wisconsin to 19 per cent. in Oregon. The States below average are Vermont, 92; Massachusetts, 91; Rhode Island, 74; Connecticut, 96; New York, 74; New Jersey, 98; Mississippi, 95; Ohio, 97; Michigan, 94; Missouri, 95; Kansas, 92; California, 95. The pro-

duct of timothy, as compared with last year, ranged from 70 in New York to 118 in Oregon; the States below average being Vermont, 87; Massachusetts, 90; Rhode Island, 77; Connecticut, 95; New York, 70; New Jersey, 93; Georgia, 97; Ohio, 94; Michigan, 91; Missouri, 97; California, 91. The average condition of the crop varied within narrower limits, the maximum being, in Texas, 116, and the minimum 87, in South Carolina. In New England and the Middle States the late rains greatly improved fall pastures generally, though, in some localities, the hay-crops, not being well secured, were damaged. Grass crops are generally satisfactory in the Southern States, though some localities in Tennessee complain of grasshoppers. In many places rain interfered with hay harvest. In Bibb County, Alabama, the only grazing or hay grass is the "Guinea" grass, which, with four cuttings, yields 4 tons per acre, and is very much relished by horses and cattle. In Comal County, Texas, cultivated pastures were very abundant in their yield. In Arkansas County, Arkansas, German millet has been cultivated with marked success, yielding 2 tons per acre with a single cutting, and a heavy subsequent growth of pasture. This grass yields from 2 to 4 tons per acre in Coffee County, Tennessee, where it promises to revolutionize grass culture entirely. Pastures are variously reported in the Northwest; in some places they were shortened greatly by drought and grasshoppers; in others the abundant and seasonable rains have made them very luxuriant. Complaints of drought are more numerous east of the Mississippi, while to the westward the grass-crops were generally large, but in very many cases were destroyed by grasshoppers. The farmers of Sacramento, California, had a busy alfalfa harvest.

MAINE.—*York:* Good hay-crop, well secured; fields and pastures green. *Aroostook:* Hay light but good.

NEW HAMPSHIRE.—*Carroll:* Pastures good. *Sullivan:* Hay better than was expected six weeks ago. *Hillsborough:* Hay greatly brought out by late rains; fall feed abundant.

VERMONT.—*Franklin:* Crop average and in fine condition. *Addison:* Pasture very short. *Chittenden:* An unusual number of farmers plowing up their old meadows and reseeding them with timothy and clover on the sward; they do not try any other crop.

MASSACHUSETTS.—*Norfolk:* Rains have greatly improved the meadows. *Dukes:* Meadows and pastures reviving from the drought.

CONNECTICUT.—*New London:* Hay short but excellent; fine prospect of after-feed.

NEW YORK.—*Washington:* Hay-crop better than was expected; quality good, improved by August rains. *Steuben:* Pastures flush; second crop of clover unusually large. *Cattaraugus:* Hay-crop short; deficiency will be supplied with broadcast corn-fodder. *Warren:* Pastures good; meadows fresh. *Columbia:* Fall pastures good. *Madison:* After-growth of meadows very fine; corn largely broadcasted for fodder. *Genessee:* Fall feed growing finely. *Jefferson:* Pastures have greatly improved. *Seneca:* Hay secured in better condition than last year. *Sullivan:* Surprising yield of hay; secured in excellent condition.

NEW JERSEY.—*Warren:* Timothy-hay a good yield; clover poor. *Cumberland:* Hay half a crop, but better than last year. *Sussex:* Late-cut bottom-hay abundant; upland grasses deficient. *Gloucester:* Pastures green and flush as in June. *Monmouth:* Fall pastures promise finely. *Hudson:* Pastures yielding abundantly; hay-crop shortened by earl drought. *Burlington:* Pastures growing rapidly. *Essex:* Injured by drought, but secured in good condition.

PENNSYLVANIA.—*Northampton:* Hay-crop shortened by drought. *Beaver:* Hay generally secured in good order; pastures grassy but wet. *Cumberland:* Fall pastures good. *Armstrong:* Extra growth of pasture. *Lycoming:* Hay, both clover and timothy, very good. *Lawrence:* Pasture greatly improved by late rains. *Elk:* Hay injured by excessive rains.

MARYLAND.—*Carroll:* Pasture abundant; clover drowned out in some cases. *Talbot:* Grass growing rapidly. *Montgomery:* Recent rains have brought out clover and pastures very finely. *Cecil:* Good quality, but below the average yield.

VIRGINIA.—*Fluvanna:* Clover light; bad stand obtained last year; timothy, a fair crop. *New Kent:* Pasturage greatly improved. *Rockingham:* Pastures splendid. *Fairfax:* Fall pastures better than for five years. *Spottsylvania:* Hay-crop very large. *Surrey:* Recent rains good for the pastures. *Halifax:* Pasturage good. *Grayson:* Hay-crop

se cured in fine condition. *Highland:* Unusually good yield of hay. *Loudoun:* Fall pasture fine. *Prince George:* Hay-crop above average.

North Carolina.—*Davidson:* Grass-crops recovered by late rains from former drought. *Chowan:* Rain rendered it difficult to save hay. *Cumberland:* Hay prospect very good. *Bladen:* Looks well.

Georgia.—*Heard:* Grass and pastures fine. *Jefferson:* Grass-crops never better.

Alabama.—*Bibb:* Guinea-grass the only kind growing here; yields 4 tons per acre good hay; cut four times a year and is very satisfactory as food for horses and cattle. *Coffee:* Grass-crops good. *Montgomery:* Hay-crop good. *Ellis:* Hay-crop the best ever made; prairie grass, mesquite, &c.

Texas.—*Red River:* Hay of all kinds never better. *Coryell:* Better than ever before. *Collin:* Great increase of prairie-hay. *Comal:* Hay-crop large. *Austin:* Prairie pasture excellent; artificial pastures produce abundance of hay; crab-grass full 3 feet high.

Arkansas.—*Arkansas:* Hay good. *Crittenden:* German millet produces 2 tons of hay per acre, the second crop being pastured. *Washington:* Increased sowing of timothy.

Tennessee.—*Rhea:* Grass-crops good. *Hamilton:* Clover and timothy short. *Washington:* Hay would have turned out well but for heavy freshets. *Bradley:* Grass-crops injured by grasshoppers. *Coffee:* Hay-crop greatly increased by the large quantity of German millet lately sown; this grass brings from 2 to 4 tons per acre, and promises to revolutionize the grass culture to the north and south. *Sumner:* Large and superior hay-crop well saved. *Obion:* Grass good. *Giles:* Best hay-crop ever made; first-rate condition. *De Kalb:* Grass crops magnificent. *Monroe:* Hay of all kinds average or above. *Putnam:* Fine quality and full average quantity. *Hancock:* Pastures eaten by grasshoppers.

West Virginia.—*Jefferson:* A good deal of fox-tail hay made. *Marion:* Fall pastures fine and rank; blue-grass springing where it appeared to be killed with grub-worms. *Mercer:* Full average and in good order. *Pocahontas:* Large and fine crop. *Pendleton:* Beautiful prospect for fall pastures. *Grant:* Haying delayed by rains; corn double loss. *Monongalia:* Hay-crop short.

Kentucky.—*Clarke:* Grass burning up. *Jefferson:* Favorable season. *Lincoln:* Meadows largely winter-killed; hay-crop well secured. *Lewis:* Hay remarkably good. *Hardin:* Pastures very short.

Ohio.—*Coshocton:* Good crop well secured. *Jackson:* Fall pastures never better. *Logan:* Some early-cut clover swept away by a freshet; in one case a mowing-machine was just visible above water. *Stark:* Hay-crop damaged by drought. *Athens:* Hay of all sorts better than last year, but much of it has been destroyed by floods; it is worth from $16 to $20 per ton. *Medina:* Grasshoppers destructive on pastures.

Michigan.—*Shiawassee:* Hay shortened by drought, but of fine quality. *Calhoun:* Early-cut hay injured by showers. *Kalamazoo:* Pastures nowhere; scarcely anything for stock to eat. *Newaygo:* Hay full average. *Van Buren:* Grass seriously affected by drought.

Indiana.—*Decatur:* Hay saved with difficulty; clover-hay principally lost. *Jennings:* Grass very good. *Morgan:* Above average. *Switzerland:* Hay light and inferior; meadows foul. *Cass:* Pastures suffering for rain. *Lake:* Fine harvest weather; splendid crop of hay secured in good condition. *Crawford:* Fall pastures very short. *Owen:* Clover-hay abundant; timothy three-fourths of a crop. *Clay:* Pastures dry enough to burn.

Illinois.—*Pike:* Pastures all dried up. *Crawford:* Injured by grasshoppers. *Clinton:* Hay short but good. *Pope:* Hay our only good crop. *Carroll:* No after-maths for hay; pastures dried up. *DeKalb:* Hay 5 per cent. below average. *Knox:* Hay short; pastures burned up. *Marshall:* Pastures very nearly used up. *Warren:* Pastures dried up, and some farmers feeding green corn. *Edwards:* Badly injured by grasshoppers; meadows partly saved by wet weather, but the quality of the hay was not good; pastures good. *Boone:* Very light timothy crop. *Cass:* Hay light. *Mason:* Good yield and quality.

Wisconsin.—*Waukesha:* Suffered from drought. *Dane:* Clover-hay short. *Dodge:* Pastures dried up. *Richland:* Summer pasture badly dried up; meadow fall-feed poor. *Dunn:* Weather favorable for hay harvest. *Outagamie:* Pasture literally burned up. *Green:* Hay-crop generally short.

Minnesota.—*Waseco:* Timothy-crop heavy. *Goodhue:* Hay good but somewhat reduced by the winter-killing of clover, and by damage to wild grass by high water *Murray:* Hay poor; natural grasses never better. *Mecker:* Abundance of wild hay, rather above average in quality, but not equal to average in quantity.

Iowa.—*Lee:* Pastures dried up. *Harrison:* Hay mostly from prairie-grass, and is not so good as usual. *Blackhawk:* Tame hay excellent; wild hay above average. *Clinton:* Hay-crop large, but no after-feed in meadows or pastures. *Marion:* Pastures suffering for rain. *Jefferson:* Pastures dried up. *Mahaska:* Pastures drying up. *Johnson:* Pastures dried up.

MISSOURI.—*Washington:* Good hay-crop; young clover nearly killed out by drought; pastures dried up. *Audrain:* Pastures nearly all dried up. *Cass:* Timothy and clover hay fine; prairie-hay shortened by drought. *Greene:* Meadows and pastures brown. *Moniteau:* Pastures burned up. *Platte:* Pastures dry enough to burn. *Newton:* Hay half a crop; grass eaten by insects. *Lincoln:* Timothy and the first clover-crop were fine, having matured before the drought; much clover killed by drought. *Adair:* Pastures drying up. *Callaway:* Grass short and dried up.

KANSAS.—*Cherokee:* Hay-crop gathered and largely baled and shipped. *Poulter:* Hay a large crop, and secured in good order. *Labette:* Hay a fine yield; 50 per cent. more than any previous yield, and of excellent quality. *Bourbon:* Timothy doubtful without speedy rain.

NEBRASKA.—*Gage:* Grass dry enough to burn; hay scarce.

CALIFORNIA.—*Sacramento:* Farmers busy in making hay of alfalfa. *Alameda:* Pastures shortened by drought.

DAKOTA.—*Hanson:* Hay-crop fine.

FRUIT.

The severity of the last winter has shown its destructive results in the shortness of all the fruit-crops. In a few counties insect injuries are noted by our correspondents; but these pests appear to have found but little scope for their ravages in the stinted growth of the crops. A scarcity and inferiority of fruit is a chronic complaint in our correspondence.

Apples.—But one State, Oregon, reports an average crop of apples. The condition of the crop ranges from 28 in Rhode Island to 102 in Oregon. Of the New England States the highest average, 61, is presented by Vermont. The Middle States range from 75 in New York to 50 in Pennsylvania; the South Atlantic coast States from 40 in South Carolina to 84 in Virginia; the Gulf States from 71 in Texas to 88 in Louisiana; the interior Southern States from 30 in Tennessee to 80 in Arkansas; the States north of the Ohio from 40 in Illinois to 78 in Michigan; the States west of the Mississippi from 57 in Kansas to 87 in Nebraska; California reaches 88. Many counties, in different parts of the country, report an entire failure of the crop.

Peaches.—This crop is, if possible, in a worse condition than the apples. Here, again, Oregon is the only State in which an average crop is reported. The State averages range from 18 in South Carolina to 122 in Oregon; in the former 11 counties, and in the latter 6 counties reported. Maine, Vermont, Wisconsin, Minnesota, Iowa, and Missouri make no reports from any of their counties, the crop being too inconsiderable to attract attention. Two counties in New Hampshire average 92, 2 in Rhode Island 87, and 19 in California 85. Of the remaining States only 11 are above 50, viz: Connecticut, 60; Delaware, (1 county,) 75; Virginia, 77; North Carolina, 54; Georgia, 60; Florida, 65; Alabama, 71; Mississippi, 70; Louisiana, 68; Arkansas, 61; Nebraska, 52; Pennsylvania, 20; South Carolina, 18; Ohio, 25. In this crop, also, many counties report the entire destruction of the crop. There is also a general complaint of imperfect fruitage.

Grapes.—The general tone of our grape reports is much higher than either apples or peaches, yet it is sufficiently discouraging. The highest condition is reported in Connecticut, 103; New Jersey, 101; Rhode Island, 100; New Hampshire, 99; Louisiana, 98; Mississippi, 97; Florida, 96; Nebraska, 95; New York, 94; Massachusetts, 92. The lowest averages are found in South Carolina, 46; Pennsylvania, 58; Maryland and Tennessee, 58; Ohio, 61. The Clinton grape in Lehigh County withstood the winter well; all others, unprotected, were winter-killed. Scuppernong grapes were killed by April frost in Darlington district, South Carolina, but immediately fruited

again, producing one-third of an average crop. In Pulaski County, Illinois, Concord grapes rotted worse than any other.

Apricots.—An apricot tree in Somerset County, Maryland, netted $102 over and above the cost of marketing.

MAINE.—*York:* Apples small and badly stung. *Piscataquis:* Apples blown off by the gale of August 24. *Lincoln:* Apples reduced by a heavy gale. *Oxford:* Light and poor.

NEW HAMPSHIRE.—*Grafton:* Apples almost a failure. *Carroll:* Apples a failure. *Sullivan:* Apples a failure. *Strafford:* Grapes injured by rose-bugs. *Cheshire:* All kinds of fruit scarce.

MASSACHUSETTS.—*Norfolk:* Apples and peaches poor; grapes good, but short. *Plymouth:* Apples scarce and dropping.

RHODE ISLAND.—*Kent:* This being the unbearing year, apples are almost a total failure.

CONNECTICUT.—*New London:* Fruit poor.

NEW YORK.—*Steuben:* Grapes maturing finely; crop 25 per cent. ahead of last year. *Ontario:* Apples and peaches short. *Wyoming:* Apples short; grapes better than usual. *Otsego:* Apples a very light crop. *Genesee:* Apples not plenty, but good. *Seneca:* Fruit injured by late frosts.

NEW JERSEY.—*Warren:* Apples fine, but few; peaches almost an entire failure, especially on low lands; grapes fine in quantity and quality.

PENNSYLVANIA.—*Northampton:* Apples, pears, and quinces a general failure. *Berks:* Peaches and grapes entirely failed. *Cumberland:* Apples and peaches scarce. *Lehigh:* The Clinton grape withstood the winter pretty well; all others, unprotected, were winter-killed. *Northumberland:* Apples few, but good; no peaches. *Beaver:* But little fruit of any kind.

DELAWARE.—*Kent:* Peaches much better than was expected before ripening.

MARYLAND.—*Baltimore:* Summer-apples dropping; winter varieties improved. Wet weather will, perhaps, injure grapes. *Howard:* Very few peaches. *Calvert:* More peaches marketed than ever before. *Cecil:* Apples very few and inferior.

VIRGINIA.—*Bedford:* Grapes rotting seriously. *Lunenburgh:* Apples injured by worms to an unusual extent. *Amelia:* Grapes rotting badly; peaches injured by late rains, becoming very insipid *Halifax:* Fruit rotted badly; very little dried for market. *King George:* Fruit fine, but late rains have rotted the peaches and grapes somewhat. *Buchanan:* Peach-crop an entire failure. *Mecklenburgh:* Apples and peaches falling badly. *King William:* Apples and grapes rotting. *Rockingham:* Fruit of all kinds good. *Warren:* Grape-crop good where not damaged by late rains.

NORTH CAROLINA.—*Davidson:* Very little good fruit; peaches better than apples. *Chowan:* Grapes not half a crop. *Alamance:* Peach-crop small and rotting badly; dried-peach shipments only 100,000 pounds against 500,000 last year. *Harnett:* Very little fruit. *Burke:* Apples nearly a failure; peaches never fail—a full crop of delicious fruit. *Princess Anne:* A farmer sold $585 worth of apples from 27 trees. *Northampton:* Fruit-crop short.

GEORGIA.—*Taylor:* All grapes, except the Scuppernong, rotting and rusting; peaches rotting. *Gwinnett:* No apples or peaches, except in a few localities, and those quite inferior. *Walton:* Peaches rotted badly. *Whitefield:* Peaches and apples have dropped off badly.

FLORIDA.—*Manatee:* Oranges 5 per cent. less than last year on account of heavy rains.

ALABAMA.—*St. Clair:* Peaches not good; apples rotting. *Blount:* Excellent crop of apples; peaches inferior in quantity and quality. *Geneva:* Fruit-crops poor. *Calhoun:* Fruit almost an entire failure.

LOUISIANA.—*Richland:* Pears fine; early varieties destroyed by frosts: some blight; Bartletts unusually fine.

TEXAS.—*Victoria:* Heavy crop of fine peaches; grapes excellent; many vines just coming into bearing. *Polk:* Fruit an entire failure. *Uvalde:* Fruits largely destroyed by frost. *Titus:* Injured by storms and frost, but of superior quality. *Atascosa:* Peaches destroyed by grasshoppers. *Austin:* Peaches of larger size than usual, but greatly injured by worms and rains.

ARKANSAS.—*Arkansas:* Apples and peaches rotting and falling off; pears excellent. *Marion:* Apples and peaches winter-killed. *Washington:* Grapes mildewed.

TENNESSEE.—*Decatur:* Fruits an entire failure. *Smith:* Apples, peaches, and grapes nearly a failure. *Greene:* Apples a failure; a few good peach-crops. *Coffee:* Fruit destroyed by spring frosts. *Haywood:* Apples destroyed by caterpillars.

WEST VIRGINIA.—*Mercer:* Apples and peaches scarce. *Pleasant:* Grapes rotting badly. *Pocahontas:* Peaches almost a failure. *Brooke:* Apple-trees injured by the borer; grapes by dry-rot. *Nicholas:* No apples or peaches. *Boone:* The few peaches that escaped winter frosts have dropped off; apples affected with bitter-rot are falling off.

KENTUCKY.—*Jefferson:* Apples good; pears small crop, trees much blighted; peaches few and imperfect; grapes good in some localities and a failure in others. *Nicholas:*

Fruit scarce and defective. *Spencer:* Peaches and apples inferior and tending to decay. *Larue:* But little fruit. *Lewis:* Apples not so plenty as last year, but better; peaches fair, but not plenty; grape-crop large, but half rotten. *Breckinridge:* Apples and peaches almost a failure, rotting and dropping before maturity. *Logan:* Peaches rotting. *Anderson:* Fruit abundant.

OHIO.—*Hardin:* Peaches and grapes failures: a few Clintons in towns doing well. *Ross:* Apples badly stung and falling off; peaches almost a failure; grapes injured by wet. *Meigs:* Peaches rotting badly; apples and grapes ditto. *Mercer:* Fruit-crop light and inferior. *Defiance:* Many fruit-trees dying, apples, pears, and all the quinces. *Gallia:* Grapes good, but small crop. *Athens:* Apples inferior, rusting and rotting; grapes unusually good. *Lucas:* Peaches an entire failure.

MICHIGAN.—*Calhoun:* Grapes good; pears a fine crop; blight affected the standard varieties, except Seckel, Buerre Diel, Clairgau, White Dozenne, &c. *Montcalm:* No peaches; very few apples; many fruit-trees dying through injuries from last winter's cold. *Macomb:* Peaches an entire failure. *Lapeer:* Apples and grapes good. *Oakland:* Apples falling from the trees.

INDIANA.—*Noble:* No peaches; apples generally good. *Perry:* Grapes rotted badly before ripening. *Ripley:* Apples few and imperfect; no peaches and few pears. *Hamilton:* Crop short; much bitter-rot. *Lake:* Apple-crop very small. *Orange:* Apples and peaches almost failures. *Crawford:* Apples and peaches almost entire failures. *Newton:* Very small crop of apples; grape-vines that escaped winter-killing are full of fine fruit. *Clay:* Few apples and no peaches.

ILLINOIS.—*Cass:* Apples almost a failure; peaches entirely so; few grapes. *McLean:* Apples poor; grapes fine and sweet; old vineyards badly winter-killed. *Pike:* Apples a half crop; cherries almost a failure except Early Richmonds. *Morgan:* Most varieties of apples failed; peach-trees mostly winter-killed; Concord-grapes a light yield; most other varieties killed. *Putnam:* Apples almost a failure. *Ottawa:* Apples scarce; grapes recovering from winter-freezing and nearly average, though late; peach, pear, and quince trees away from the lake shore mostly winter-killed; one-tenth of the apple-trees killed. *Pulaski:* Concord grapes rotted badly; other varieties not so bad. *Wayne:* Few apples and no peaches or grapes.

WISCONSIN.—*Juneau:* Cranberries abundant, especially where cultivated. *Chippewa:* Apple-trees badly killed. *Milwaukee:* Apple-crop short.

MINNESOTA.—*Goodhue:* Apples and grapes show the sad effects of last winter; trees dying all summer; apples few and poor.

IOWA.—*Harrison:* Apples and grapes greatly reduced by grasshoppers, which killed many of the young trees. *Louisa:* Apple-crop short, but good. *Benton:* Apples injured by worms. *Blackhawk:* Fruit of all kinds short; if frost delays, grapes will be a tolerable crop. *Polk:* Apples almost ruined by heavy storms. *Outagamie:* Apples a failure; fruit of all sorts very light. *Green:* Fruit first-class in quality, but only a fourth of a crop. *Crawford:* Apples, grapes, and other fruit almost a total failure. *Ringgold:* Fruits shortened by drought. *Linn:* Grapes nearly a failure; apple-trees dying all summer from the effects of last winter's freezing.

MISSOURI.—*Cass:* Peaches a failure; apples more or less wormy. *Harrison:* Peaches an entire failure; grapes doing well. *Platte:* Apples almost a failure as to quality; many young orchards killed by grasshoppers. *Newton:* Apple-crop light; no peaches of consequence; grapes badly injured by insects. *Boone:* Apples almost a failure. *Daviess:* Peaches a failure. *Perry:* The few apples that remain are rotting and falling off. *Shelby:* Many apple-trees killed by winter-freezing; grapes almost a total failure from same cause. *Taney:* Peaches a failure. *Pettis:* The twigs of nearly all apple-trees have died about eight inches from their ends; Jeanettons suffering most; Bell-flowers entirely exempt. *Pulaski:* Apples suffering from dry or bitter rot; peaches winter-killed; grapes not a success. *Dallas:* Apples inferior; not a peach. *Calaway:* No peaches; few apples. *Laclede:* Peaches killed; apples one-fourth of a crop.

KANSAS.—*Doniphan:* Fruit-crops poor. *Lincoln:* Peaches killed in the bud by cold weather. *Woodson:* Fruit almost a failure; grapes destroyed by rose-bugs. *Osage:* Very few peaches; apples scarce; grapes falling from the bunches. *Douglas:* Apples less than half a crop; no peaches; fruit-trees blighting. *Jackson:* Apples injured by worms.

CALIFORNIA.—*Napa:* Apples and pears failed to bud; peaches and grapes killed by frost. *Nevada:* Apples abundant, but all other fruits injured; mildew in grapes. *Sonoma:* Grapes in better condition than was supposed. *Amador:* Peaches and grapes injured by late frosts. *Contra Costa:* Grapes fine, but a third short. *El Dorado:* Peaches very fine; many weigh over a pound each; grapes good.

OREGON.—*Douglas:* Peach-crop injured by late frosts; grapes injured by the same. *Linn:* Apples better than last year; no peaches; plums scarce, the trees becoming unhealthy and the fruit stung by the curculio for the first time. *Grant:* Fruit-trees generally quite young; fruit-culture becoming more successful, especially peach-culture; orchards of 5,000 trees to be found. *Clackamas:* Apples 50 per cent. above average; peaches good; grapes 25 per cent. below average.

UTAH.—*Beaver:* Frost in May killed all the peach and 80 per cent. of the apple bloom. *Salt Lake:* Apples seriously damaged by worms; fruit small and ill-tasted.

SUGAR-CANE.

Two counties in South Carolina report the condition of this crop 5 and 10 per cent. above average, respectively; 18 counties in Florida average 98; 21 in Georgia average 108; 7 in Alabama, 114; 6 in Mississippi, 96; 10 in Louisiana, 95; 15 in Texas, 96.

FLORIDA.—*Orange:* Fine weather for sugar-cane. *Jefferson:* Crop good. *Wakula:* Good; ratan-cane winter-killed. *Jackson:* Doing well. *Leon:* Doing well. *Leon:* Good. *Gadsden:* Sugar-crop large.

GEORGIA.—*Glynn:* Recent rains very favorable for cane, which is very promising. *Brooks:* Good.

ALABAMA.—*Geneva:* Good crop.

LOUISIANA.—*St. Mary:* Rainy weather favorable to cane-crop. *Terrebonne:* Plant-cane good; stubble bad. *Iberia:* Cane excellent and growing rapidly. *Rapides:* Fair average; but little stubble-cane.

TEXAS.—*Polk:* Average decreased one fourth. *Gillespie:* Red and black seeded: African cane in good order; the second seed.

TOBACCO.

The general average for tobacco in September was about 90. This crop was above average in Georgia, Florida, Alabama, Texas, and Tennessee, and average in West Virginia. In New England the crop was 82 in Massachusetts and 90 in Connecticut. In the former State it ripened two weeks earlier than usual in some places. In Pennsylvania and Maryland it was seriously injured by late rains, very greatly reducing its condition and yield. The same causes operated in Virginia and North Carolina, though to a less extent. In many counties the planting was very late, but with good fall weather the farmers expected to make a good crop. In Gadsden County, Florida, the cultivation of Cuba tobacco has become quite extensive. In the Gulf States and Tennessee the crop was quite successful, but in the Northwestern and Pacific States the crop was below average generally.

NEW HAMPSHIRE.—*Grafton:* The few tobacco-fields look well.

MASSACHUSETTS: Earlier than usual by two weeks; will probably escape frost; some pieces ruined by a hail-storm August 23.

NEW YORK.—*Wayne:* Heavy crop; weather very seasonable.

PENNSYLVANIA.—*York:* Crop improving; may yet reach an average.

MARYLAND.—*Charles:* Seriously injured by late rains. *Howard:* Greatly benefited by recent rains.

VIRGINIA.—*Charlotte:* Crop late and cannot come up to an average. *Bedford:* Much damaged on bottom-lands by high water. *Lunenburg:* Suffered much from unfavorable weather. *Amelia:* Seriously affected by hot, wet weather; looks as if sprinkled with boiling water. *Nelson:* Late and irregular. *Campbell:* Late, owing to scarcity of plants. *Orange:* Late, but growing finely; will reach an average if the fall be fine. *Pittsylvania:* Generally poor; planting season unfavorable. *Halifax:* Somewhat improved; crop late; horn-worms destructive. *Buckingham:* Plants large but injured by excessive wet in low grounds and fired on high grounds; much of the crop will be entirely lost. *Mecklenburgh:* Much improved by August rains.

NORTH CAROLINA.—*Caswell:* Improved by late rains but needs a favorable fall to mature. *Person:* Much improved by August rains and will make a full yield; acreage decreased on account of drought and scarcity of plants. *Alamance:* Unpromising; poor stand obtained. *Yadkin:* Much improved by late rains.

FLORIDA.—*Gadsden:* Large crop of Cuba tobacco.

TEXAS.—*Austin:* Second cut hardly inferior to the first.

TENNESSEE.—*Obion:* Very good. *Monroe:* Good.

WEST VIRGINIA.—*Mercer:* Below average, but improving.

KENTUCKY.—*Logan:* Bids fair for a superior crop. *Edmonson:* Materially shortened by drought. *Lewis:* Largest acreage and yield ever known. *Graves:* Finest prospect in eighteen years.

INDIANA.—*Spencer:* Injured first by excessive rain and then by drought.

MISSOURI.—*Lincoln:* Greatly shortened by drought.

Table showing the condition of the crops, &c., on the 1st day of September, 1873.

States.	CORN.	WHEAT.	RYE.	OATS.	BARLEY.	BUCK-WHEAT.	POTATOES.	POTATOES. (Sweet.)	TOBACCO.	COTTON.	HAY.		
	Average condition September 1.	Average condition when harvested.	Average condition when harvested.	Average condition when harvested.	Average condition when harvested.	Average condition September 1.	Average condition September 1.	Average condition September 1.	Average condition September 1.	Average condition September 1.	Product of timothy compared with last year.	Average condition of timothy when harvested.	Product of hay of all kinds compared with last yr.
Maine	87	83	92	84	92	98	88	.....	.....	.....	103	105	105
New Hampshire	100	95	95	94	90	102	98	.....	93	.....	104	105	107
Vermont	90	96	96	100	97	100	91	.....	.....	.....	87	99	92
Massachusetts	99	102	98	95	96	92	95	.....	82	.....	90	100	91
Rhode Island	96	.....	101	90	92	.....	75	.....	.....	.....	77	105	74
Connecticut	95	104	102	81	82	91	99	.....	90	.....	95	110	96
New York	90	72	96	97	90	103	102	.....	.....	.....	70	93	74
New Jersey	104	105	97	74	.....	90	63	90	.....	.....	93	87	98
Pennsylvania	87	102	99	81	90	100	92	94	77	.....	100	90	160
Delaware	90	85	.....	80	.....	100	70	50	.....	.....	105	85	120
Maryland	94	96	102	92	93	101	95	90	70	.....	108	97	110
Virginia	99	82	93	103	.....	101	98	100	80	98	108	104	110
North Carolina	99	82	85	102	.....	101	96	101	80	95	104	98	105
South Carolina	95	75	94	105	90	.....	102	99	.....	86	.....	87	104
Georgia	103	75	90	108	97	100	103	108	107	90	97	102	107
Florida	103	.....	.....	98	.....	.....	104	105	100	85	.....	.....	103
Alabama	94	85	85	107	82	.....	102	101	106	85	.....	100	102
Mississippi	87	90	100	99	.....	.....	100	101	.....	82	.....	.....	95
Louisiana	90	.....	.....	96	.....	.....	96	95	.....	80	.....	.....	104
Texas	80	85	95	100	98	94	91	111	104	92	110	116	113
Arkansas	93	95	99	105	.....	.....	95	97	100	93	103	99	117
Tennessee	80	78	91	105	97	98	99	101	102	92	106	100	112
West Virginia	105	91	88	105	100	103	89	100	97	.....	102	100	103
Kentucky	94	85	84	100	90	98	90	97	93	.....	102	98	102
Ohio	91	97	99	86	95	96	88	94	100	.....	94	95	97
Michigan	84	96	98	97	90	90	99	.....	.....	.....	91	100	94
Indiana	87	84	95	87	92	86	86	94	101	.....	106	99	107
Illinois	68	93	91	95	83	80	63	84	90	.....	91	100	92
Wisconsin	89	107	99	88	99	92	87	.....	102	.....	103	103	102
Minnesota	100	109	100	101	90	98	92	.....	.....	.....	110	106	108
Iowa	81	100	99	97	81	82	60	78	82	.....	110	105	109
Missouri	67	100	96	95	93	65	67	75	99	96	97	101	95
Kansas	63	100	102	92	95	60	52	91	95	.....	101	99	92
Nebraska	63	107	104	73	96	73	48	88	.....	.....	101	101	103
California	97	92	97	94	92	98	104	101	86	.....	91	96	95
Oregon	102	107	103	110	106	91	100	.....	.....	.....	118	100	119

Table showing the condition of the crops, &c.—Continued.

States.	BEANS.	SORGHUM.	SUGAR-CANE.	HOPS.		STOCK HOGS.		WOOL.	APPLES.	PEACHES.	GRAPES.
	Average condition September 1.	Average condition September 1.	Average condition September 1.	Acreage compared with last year.	Average condition September 1.	No. for fattening compared with last year.	Average condition as to weight and size.	Wt. of fleece compared with an average crop.	Average condition September 1.	Product compared with an average.	Average condition September 1.
Maine	88	.....	.....	105	87	98	100	100	65	.....	85
New Hampshire	99	.....	.....	102	100	100	100	100	50	92	99
Vermont	99	.....	.....	102	95	92	100	96	61	.....	75
Massachusetts	96	.....	.....	.....	.....	95	97	100	57	47	92
Rhode Island	101	.....	.....	.....	.....	100	97	100	28	87	100
Connecticut	100	.....	.....	.....	.....	95	100	102	54	60	103
New York	101	.....	.....	94	89	97	100	99	75	42	94
New Jersey	88	.....	.....	.....	.....	99	99	102	68	36	101
Pennsylvania	100	.....	.....	98	98	90	100	98	50	20	55
Delaware	80	75	.....	.....	.....	100	100	100	75	75	75
Maryland	.....	.....	.....	.....	.....	99	98	98	60	43	58
Virginia	96	93	.....	127	100	95	97	95	84	77	94
North Carolina	98	95	.....	.....	.....	96	100	98	50	54	76
South Carolina	97	96	.....	.....	.....	96	95	95	40	18	46
Georgia	103	100	108	.....	.....	97	96	97	71	60	80
Florida	102	.....	98	.....	.....	102	99	96	.....	65	96
Alabama	98	94	114	.....	.....	96	96	99	81	71	75
Mississippi	97	95	96	.....	.....	88	94	100	80	70	97
Louisiana	.....	.....	95	.....	.....	95	99	99	88	62	98
Texas	98	104	96	.....	.....	95	99	98	71	46	80
Arkansas	93	90	.....	.....	.....	85	82	102	80	61	72
Tennessee	103	101	.....	.....	.....	91	97	97	30	27	58
West Virginia	101	99	.....	100	89	97	103	95	75	40	89
Kentucky	100	88	.....	.....	.....	92	102	99	58	47	74
Ohio	94	87	.....	102	103	95	100	98	61	25	61
Michigan	98	90	.....	93	86	97	98	101	78	27	88
Indiana	92	90	.....	100	100	93	99	100	60	37	70
Illinois	87	80	.....	.....	.....	89	99	98	40	24	60
Wisconsin	103	105	.....	90	88	87	100	96	65	.....	70
Minnesota	93	83	.....	98	99	89	102	101	77	.....	83
Iowa	85	87	.....	80	80	97	100	100	58	.....	76
Missouri	79	79	.....	.....	.....	97	98	99	58	.....	64
Kansas	81	92	.....	.....	.....	109	104	101	57	28	79
Nebraska	76	90	.....	.....	.....	110	105	99	87	52	95
California	93	.....	.....	106	103	97	95	97	88	85	77
Oregon	113	.....	.....	.....	.....	83	102	107	102	122	92

Table showing the condition of the crops, &c., on the 1st day of August, 1873.

States.	CORN.	SPRING-WHEAT.	SPRING-RYE.	OATS.	BARLEY.	BUCKWHEAT.		POTATOES, (Solanum tuberosum.)	POTATOES, (Batatas edulis,) SWEET.	TOBACCO.
	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average compared with last year.	Average condition August 1.	Average condition August 1.	Average condition August 1.	Average condition August 1.
Maine	84	88	91	88	87	92	95	91		
New Hampshire	100	95	96	92	93	98	99	99		87
Vermont	90	89	95	92	89	98	92	97		
Massachusetts	98	95	95	81	85	100	92	87		85
Rhode Island	103			93	90			68		
Connecticut	93			84		76	82	81		70
New York	83	85	95	78	82	98	95	95		96
New Jersey	86			85		101	89	82	77	
Pennsylvania	88	94	97	92	89	97	98	92	86	93
Delaware	67			75		100	100	50	57	
Maryland	66			75	86	94	92	60	72	59
Virginia	97			109		94	97	100	97	95
North Carolina	90	72	87	106		100	98	96	96	85
South Carolina	84			98				98	103	
Georgia	100			113				104	103	103
Florida	108			108				105	108	
Alabama	93			113		88	85	101	100	101
Mississippi	90			103				101	99	100
Louisiana	84			97				98	100	
Texas	81			102	99			89	105	98
Arkansas	91			106				97	97	98
Tennessee	96			107	102	91	100	97	100	97
West Virginia	101			109	96	101	99	94	101	103
Kentucky	93			95	94	99	98	95	98	89
Ohio	91	88	90	90	90	97	100	96	97	87
Michigan	93	99	100	97	91	105	100	104	97	110
Indiana	92			82	86	95	99	99	102	100
Illinois	87	99	96	90	88	97	95	90	96	100
Wisconsin	97	106	103	109	100	99	98	99		89
Minnesota	94	93	94	96	87	96	94	88		
Iowa	93	97	95	94	88	97	95	90	97	
Missouri	90	96	95	96	99	97	93	91	90	92
Kansas	95	98	100	106	97	109	96	87	94	93
Nebraska	92	108	100	98	100	90	93	94	87	
California	92	94	98	94	94	93	96	93	94	
Oregon	100	113	111	115	111	101	90	113		

Table showing the condition of the crops, &c.—Continued.

States.	HAY.			PASTURE.	BEANS.	COTTON.	SORGHUM.	SUGAR-CANE, (not sorg'm.)	APPLES.	PEACHES.	GRAPES.
	Average condition of timothy, Aug. 1.	Product of clover compar'd with last y'r.	Average condition of clover when harvested.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.	Average condition Aug. 1.
Maine	105	151	109	101	94	.....	.....	.....	67	.....	93
New Hampshire	100	107	105	101	100	.....	.....	.....	66	65	88
Vermont	93	88	101	96	96	.....	.....	.....	75	.....	84
Massachusetts	87	90	91	83	100	.....	.....	.....	46	38	96
Rhode Island	76	73	93	70	97	.....	.....	.....	70	86	95
Connecticut	93	100	110	88	100	.....	.....	.....	46	36	78
New York	74	72	90	85	100	.....	.....	.....	57	45	89
New Jersey	84	75	84	70	92	.....	.....	.....	61	29	96
Pennsylvania	93	99	95	97	94	.....	92	.....	67	22	70
Delaware	62	87	75	42	80	.....	90	.....	40	107	87
Maryland	73	74	74	66	80	.....	.....	.....	56	46	90
Virginia	102	110	105	99	98	108	95	.....	83	82	95
North Carolina	100	102	101	100	97	95	94	.....	47	52	81
South Carolina	105	.....	.....	104	100	87	.....	.....	42	32	63
Georgia	96	143	98	108	102	95	100	102	75	61	79
Florida	.....	.....	.....	107	.....	103	.....	100	.....	65	96
Alabama	111	105	98	110	107	91	100	108	71	67	85
Mississippi	115	81	72	108	102	88	95	102	77	62	100
Louisiana	.....	.....	.....	109	.....	86	.....	94	96	64	100
Texas	.....	.....	.....	117	133	83	102	97	59	51	79
Arkansas	104	108	101	104	95	93	94	.....	82	60	78
Tennessee	100	100	95	108	100	95	98	.....	27	32	69
West Virginia	104	103	105	107	100	.....	99	.....	71	50	99
Kentucky	98	92	96	101	100	.....	90	.....	56	57	79
Ohio	95	100	95	107	99	.....	88	.....	66	29	59
Michigan	95	93	100	97	101	.....	92	.....	79	42	96
Indiana	99	104	93	109	98	.....	90	.....	60	37	75
Illinois	96	89	97	98	94	.....	90	.....	47	20	73
Wisconsin	105	78	93	102	97	.....	.....	.....	58	.....	79
Minnesota	105	101	95	105	89	.....	92	.....	74	.....	87
Iowa	107	100	101	100	93	.....	95	.....	66	68	76
Missouri	99	105	101	91	86	86	86	.....	62	35	75
Kansas	101	106	102	106	96	96	98	.....	74	30	85
Nebraska	104	.....	.....	110	89	.....	102	.....	78	72	102
California	92	108	97	87	94	.....	.....	.....	95	80	72
Oregon	109	111	103	115	105	.....	.....	.....	100	88	102

STATISTICAL MISSION.

The Statistician of this Department was commissioned, in May last, as its representative at the International Exhibition at Vienna, Austria, and was also instructed to investigate the status of agricultural statistics, and the means and appliances used in official statistical collection in the countries of Western Europe. He also received a commission from the State Department to the same exhibition.

An incidental purpose of the mission was to study the possibilities of the inauguration of an international system of crop reports. No official system of reporting the condition of growing crops was found in operation, and no systematic attempts at such reports are essayed, except in a few instances, as in the case of London newspapers, which collect, somewhat systematically, the opinions of their correspondents relative to the grain yield. Suggestions of a practical nature upon this subject are reserved for future elaboration.

The government offices of London, Paris, Berlin, and Vienna, were visited, and every facility was courteously furnished for investigation of their statistical methods and their operations in aid of agriculture. The official representatives of the United States at these seats of government promptly rendered all desired aid in procuring facilities for such investigation. There is great diversity in the organization, scope, and action of the agricultural departments of these governments. Some are connected with other branches of administration, and others are invested with the dignity of full departments. An increasing importance is of late accorded to them, and they are evidently becoming more efficient and useful. They are generally organized upon a foundation of less breadth than that of our own, but pursue investigation with greater tenacity and thoroughness, and are enabled to do so by more liberal appropriations of money, thereby rendering their special reports of greater value. Their annual reports are of less interest, and do not appear to have a very extended circulation. An exposition of the main features in the organization will hereafter be given in the monthly or annual reports.

A period of ninety days allotted to such a mission was found quite too short for the investigation and travel involved, and but four weeks could be spent in Austria at the *Welt Austerlung*, the *Ackerbau ministerium*, at field trials of machinery, public and private exhibitions of farm animals, and in rural observation of the methods of practical agriculture. A mass of statistical data, a great variety of official and other publications, were collected, and will be utilized in future numbers of these reports. An assignment, by the Scientific and Artisan Commission, of the subject, "Wools of the exhibition," was accepted, and a report will be made to the State Department. A formal report of the agricultural features of the exhibition in detail is not deemed desirable, full publicity having already been achieved in the periodicals of the day, but all that is deemed suggestive and valuable will be presented in connection with technical and statistical data, much of which is yet to be translated and prepared for specific presentation.

The American portion of the exhibition, of which so much has been unjustly said, was not so complete as it should have been, nor was it so meager as has been represented. In mowing and reaping machines it was represented fully, and in the experimental trial few competitors were found, and undoubtedly no successful competition could have been

inaugurated by the manufacturers of the world; in other agricultural implements there were comparatively few entries. The intelligent foreigner appeared to realize that American manufacturers generally do not seek a European market, and that the reaper, the sewing-machine, tramway-car, the shoe-manufacturing machinery, and other articles that stood in apparent isolation, were there because foreign markets were opening rapidly for them. These characteristic American inventions, realizing the labor-saving idea and a marvellous economy and suitability of material, were recognized as a very few forms representing at home a broad series of manufacturing industries. There were not a few European mechanics who were candid enough to say that a large proportion of the new ideas in mechanism brought forth by exhibition were to be found in the American department.

THE OSIER WILLOW.

By the Commissioner of Agriculture.

The Salix or Willow: in a series of papers, by William Scaling. Practical instructions for planting and culture; with observations on its value and adaptability for the formation of hedges, &c." London, 1871.

This little work is prepared by one who derives his knowledge from the experience of many years in the propagation of the willow, and treats the subject of the various species of willow, their mode of propagation, and the uses to which they may be applied, for the purpose of communicating his knowledge to others and of promoting this interesting industry.

Little attention or study has been bestowed upon the willow-plant in the United States, although there is scarcely any part of the country in which it may not be successfully raised. It grows readily from cuttings, and in almost any quality of soil, although, like all other plants, its quality will be characterized by the soil in which it grows. The various purposes to which the willow may be applied, its extensive usefulness, and the facility with which it may be raised, command the attention of our farmers whether it may not be made a most profitable industry. The species of willow best fitted for cultivation involves the consideration of the purposes for which they are designed and the quality of soil in which they are to be grown. For wicker-work, such as baskets, carriage and sleigh bodies, a particular species is most profitable; whilst for hedges another species is better adapted; and for coopers' hoops or poles another is more fit. So that any one about to enter upon the business of propagating the willow should consult not only the quality of his soil but the market where he was likely to dispose of his product. Doubtless the use of the willow in this country would be greatly multiplied by the facility for obtaining it, and by the improvement of the quality, which would be a necessary consequence of its careful cultivation. It has been estimated that between six and seven thousand acres in England and Ireland are now appropriated to the cultivation of the willow, and yet there is imported into that country, from France, Belgium, and Holland, 4,400 tons, of the estimated value of $218,045, in addition to baskets of the value of $224,200, and the extension of the trade is gradually increasing. The following table, obtained from the Bureau of Statistics, is interesting, as showing the progress in the use of the willow in the United States:

Statements of imports into the United States of willow or willow ware during the ten years ending June 30, 1873.

Fiscal years ended June 30.	Willow or willow ware.	Willow or osier prepared for use.	Willow or osier wares, baskets, and all manufactures of like material.
1863	$89,916		
1864	139,353		
1865		$88,803	$28,028
1866		225,660	57,907
1867		202,408	39,078
1868		202,957	36,302
1869		178,689	37,512
1870		204,409	50,715
1871		205,573	39,935
1872		265,145	48,884

It is very certain that there has not been an importance attached to raising the willow in this country, which has induced a systematic and careful cultivation of it; and when it is grown it is without that care which is necessary to improve its quality and quantity.

The author of the papers whose work we propose to review and from which to quote largely, treats of the mode of cultivation, the varying species, and the uses to which the willow is applied. He says:

There is a very widely spread, but erroneous opinion, that the willows will only grow in wet, boggy ground; and that, as an article of produce, they are not worth the attention of the cultivator. With ordinary care a willow-crop will pay the grower as well as any crop on the farm, and with this advantage, that land comparatively valueless for root or grain crops can be used for an osier plantation. To grow willows successfully there must be an adaptation of the variety to the soil: if this is not attended to, either the crop will be a failure or the produce will be deficient in the qualities most sought after. The following rule may serve to guide intending planters: All the varieties of the soft-wood class, known in the trade as osiers, will grow in a much damper soil than the hard-wooded, generally called fine-tops. The present market-price of green willows ranges from two to five pounds, and of peeled willows from nine to twenty-five pounds per ton. This wide range in value shows the necessity of exercising care in selecting suitable kinds for planting, and of planting each variety in the soil best adapted to its requirements. The following properties must be sought after for willows intended to be used in the green or brown state: toughness, level surface, full top, wood soft, remain a light brown color when dry, and a good cropper. For willows intended to be used in the peeled state, the under-mentioned qualities are necessary in order to realize the best market-price: toughness, elasticity, level and smooth surface when peeled, peel a good color for either white or buff, split well and make good scains, great length of shoot in proportion to thickness, small quantity of pith, hardy and not liable to diseases, a tendency to grow straight and clear of side-shoots, and a good cropper.

As a rule willows are tougher when grown on strong loam, inclining to clay, than on any other soil; but some of them, as the *Salix helix*, or rose willow, a vigorous plant on lighter soil or warp land, becomes a mere scrubby shrub when planted on clay. The varieties of willow are extremely numerous. Dr. Host, of Vienna, is said to have cultivated over 300 sorts; his grace the Duke of Bedford, at Woburn Abbey, about 250 sorts; and the nursery at Basford contains over 300 varieties.

In reference to the preparation of an "osier plantation," the writer lays much stress upon "accurate planting," as conducing to the subsequent ease with which the plants can be cultivated and kept clear of weeds; and then says:

One of the first things to be observed in forming an osier plantation is to drain it of all stagnant or surplus water, as no basket-willow will arrive at perfection in land

saturated with moisture. It must also be well pulverized or prepared to a depth of 12 or 13 inches, and thoroughly cleared of weeds; and, if poor, well manured before planting. If it is strong, cold land, lime may be used with advantage; but if lime is applied on light land the crop of osier will be scabbed or cankered. If possible, avoid open drains, and throwing the land into beds; where drains are required use pipes, as open drains would interfere very much with the economical working of the land afterward. If the land is well cleaned and properly prepared, much after-expense will be spared, and better crops will be obtained. The opposite course would be false economy.

Much difference of opinion exists among growers as to the size and age of cuttings; the distance between the plants; how far it is necessary to push them into the soil; and how far to leave them out or above the ground. I have very carefully examined the various methods—have tried and experimented upon them—and find the following plan to be the best, producing the heaviest crops, best quality, more easily and consequently more cheaply cleaned, the least exhaustive of the soil, and if it is desirable to change it to ordinary arable land again, it can be done at a very moderate expense. The cuttings may be taken from either the one or two year old shoots; if the one-year old shoots are well grown they will strike more easily, and throw out quite as strong spray or shoots as two-year olds, and are not quite so expensive; they should be nine, or at most ten, inches long, and cut from the rod with a sharp knife, in a slanting direction. The bottom or root end of the rod is first sharpened, then take the first ten inches with *one* sharp cut, again sharpen the rod and cut off a second, and so on for the third, if the rod is very finely grown. Not more than three cuttings should be taken from one rod, unless it is a two-year old, in which case it may be cut up to the entire length of the first year's growth. In cutting the sets not more than *one* cut should be made, however thick the rod may be, as it is necessary to have the ends without any split or shatter. If the rods from which the cuttings are obtained are in good condition the cuttings will sustain no injury by remaining out of the ground for five or six weeks, if not exposed to very dry winds. All the varieties of *S. fragilis*, or willow proper, will do best planted 18 inches by 12; the varieties of *S. viminalis*, or osier, 18 inches by 12. *S. amygdaliana*, and its varieties, known in the trade as Spaniards, Germans, Italians, &c., will do best and produce the heaviest crops planted 16 inches by 8; and this distance will do for all the finer kinds of willows.

The writer then describes a mode of planting by means of a frame, which marks the particular spot at which the plant is to be inserted in the ground:

This will be found a much more expeditious as well as more accurate method than planting by lines, and the cost of such frame is not more than a few shillings. If the ground is in good condition two active boys will plant, with this frame, 4,000 cuttings per day. To prevent the ends of the cuttings injuring the hands by pushing them into the ground, hand-leathers must be used; the thumb and forefinger of the right hand must also be covered, to enable them to push the cuttings quite into the ground, as no part of the plant must be left uncovered; this is a very important point to be attended to. The cuttings must be pushed in a little slanting; they will be more easily got into the soil, and put out side roots better than if pushed in perpendicularly.

The advantages to be derived from getting the cuttings quite into the ground are many: Rods so planted send out straight shoots, and when the crop is cut off close to the ground manure can be applied the land plowed between the rows and harrowed over, and kept as clean as an ordinary arable field. This, by many, will be looked upon very skeptically, but I have practiced it for some years, and have every reason to be satisfied with the result.

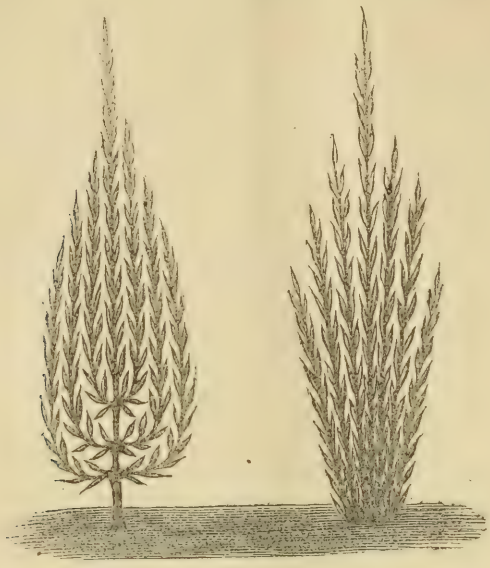
Before this method was adopted I found it next to impossible to keep willow-grounds from being overrun with weeds; strong land, more especially, became sodden and hard, and the weed-roots could not be got out by the hoe. It has often been asked whether the roots of the willows do not get destroyed. In some cases the roots are disturbed slightly, but disturbing a few roots does not injure the plant, and great vigor is imparted to them by manuring and pulverizing the ground. After the land has lain some time in ridges and has shown a tendency to break down, I use a harrow with the teeth rounded at the ends so as not to tear or split the plants. A willow-plantation worked in this way presents a very different appearance to the reedy rubbish beds, with a few moss-grown pollards dotted about, and called osier-grounds, met with in many parts of the country.

The accompanying illustration shows the difference between willows growing direct from the ground and those planted in the old style.

Willows grown straight are more valuable than when bent or crooked at the butt, and they cannot be grown straight if the stools stand above the ground. By cutting close to the ground the stools or roots do not rot or become covered with moss, and by turning over the ground and keeping all clean, the larvæ of insects destructive to the plants are got rid of; and if it is desirable to stub the ground, so as to use it for other

purposes, a strong plow and a good team of horses, taking the rows cross-way on, will easily rid the ground of roots, or so loosen them that they can be got out with a drag, at less than half the cost of stubbing by the spade in the ordinary way.

Nearly all the writers on the subject of willow-planting recommend that the first year's shoots, after planting, remain on the stools, not to be cut until the second year.



Osier willow.

The reason assigned for which plan is, that the roots may get better and firmer hold of the ground before they are disturbed by cutting. In whatever light this is viewed I hold it to be radically wrong; for, should the first year's crop (which is usually the case) be short, full of shoots at the sides, and dwindling, they would be of no value whatever if allowed to stand for two-year olds. The value of a two-year-old willow depends entirely upon the shank, or first year's shoots, being long and straight; the second year's growth merely adding thickness and solidity. Should the first year's shoots be allowed to remain—the roots having obtained so little hold of the ground—the wind will act upon the long shoots as a lever, and loosen the roots much more than careful cutting would do.

In the majority of cases the first crop will be nearly worthless, but if carefully cut off, the second crop will be of considerable value.

He then enforces the necessity of keeping the ground clear of weeds, and proceeds to give the following directions with regard to cutting and preparing the plant:

Whether the crop is intended to be used green, or to be peeled, it ought to be cut off in the months of November and December, and the land stirred up with the plow. If cut off at this time the buds remaining on the stools will swell during the winter, and be much more likely to put forth vigorous shoots than if cut off nearer the spring, and the land will receive the benefit of the winter's frost by being broken up. The rods must not, in any case, be cut until the leaf has fallen, or a flow of sap will follow the knife, and the plant will be weakened in consequence. For cutting close to the ground a heavy, hooked knife, cranked near the handle, must be used; it must be very sharp, and the cutting stroke must be sharp and decisive; each stool or root must be cleared by one stroke, the rods being held tightly in the left hand. If any plant is found defective or dead remove it, and stick into the vacant place a full-grown rod, and let it stand to grow. If a short cutting is put in, the surrounding plants will, in all probability, smother it, and prevent its growing.

Cutting is generally paid for by the bundle, the price in the midland counties being 2*s.* 6*d.* per score bundles, 3 feet girth when tightly tied up. The tie or band should be about 8 or 9 inches from the butt or root end of the rods, and the measure be taken

close to the band. These prices vary a little in different districts, and are only mentioned here to give a general idea of the cost of osier-cutting where the crop is of average size. If the crop runs small, the price will be more per score bundles; if over the average size, a little less. When cut and tied, the rods should be cleared off the ground at once, and, if for peeling white, they must be placed standing on their butts in the water to the depth of 6 or 8 inches, firmly fixed in their position (so as not to be disturbed by the wind) until they begin to grow in the spring, and the bark becomes sufficiently loose to be removed, which may readily be ascertained by trying to strip them with the fingers. If the crop is to be peeled buff, by using boiling water to loosen the bark, or if intended to use green or be dried as brown, they can be reared on the butts in any dry place until the sap has left them, and they are dry enough to put under cover; or stack and thatch down if more convenient.

It may be necessary to explain what is meant by peeling buff, in contradistinction to peeling white. It is now greatly the fashion to make baskets of willows peeled by steaming or boiling, instead of peeling by the ordinary course, as it has been found that the baskets of the boiled willow are much firmer, and wear considerably longer than when made of white rods; and in the process of boiling, the coloring matter contained in the bark stains the willow a buff color. The extra durability of baskets made of the boiled willow over those made of willows peeled white, only requires to be more generally known to make white baskets things of the past, where wear and tear is required.

Many will consider the willows too crowded by planting so closely as I have here recommended. It must, however, be borne in mind that no instructions are given here that have not been practically tested by myself, and compared with the results of other systems, both in weight and quality of crops, and in the ease and economy of working.

It has been stated before that two essential qualities in a good basket willow were length of shoots, with the least thickness, also freedom from side branches, qualities which can best be obtained by close planting.

All varieties of willows, however straight their tendency may be, if allowed too much room, will spread, thicken, and throw out side branches; this will easily be seen by examining any well-managed osier ground, where the outside rows will be found crooked, and of less value than the inner rows. Let any one examine a willow-holt, and it will be found that those rods are the best where the growth is the closest. It has been urged by what may be called the old school of planters, that if planted so closely in a few years the stools would touch each other. This would be the case if cut above the ground, and heads three parts rotten and useless, and as large as cabbages, were allowed to accumulate. But this, to a great extent, is prevented by the method of cutting recommended.

The system of close planting and cutting to the ground has been practiced in Belgium for many years, and so successful have the Belgium planters been that they now export largely, not only to Great Britain, but to America. The sorts they cultivate are inferior to many of ours, but the management of their grounds is better. All growers of willows will have observed that the first crop or two after planting always grow crooked and full of side-shoots; this is entirely due to wide planting. The first year the cutting or plant does not put out more than two or three side-shoots, and those, as a rule, rather small; they have thus ample room to follow their natural tendency; light and air being procurable all around them, they have not to seek it upwards.

Willow-crops, like corn or root crops, are subject to many diseases, and it will appear strange to those who have been accustomed to consider the willow as a thing requiring no attention to be told that it is subject to as many diseases as a crop of turnips, and requires as much care to be grown successfully. The *Aphis* or smother-fly is a great pest to all the sweet-scented or soft-wooded willows, known to basket-makers under the term of soft sorts or osier, *S. holosercia* suffering more than any other variety: hence the great uncertainty of obtaining a good crop from this willow, for as a productive yield seldom occurs above once in three years, it renders it the most unremunerative sort of basket-willow grown, notwithstanding its good qualities and the great value of a good crop when obtained. Isolated cases of extraordinary crops of this variety have been made public, and the extreme risk being kept out of sight, has caused a sort of "nine days' wonder," at the great profits of willow-growing. Intending planters must not reckon upon realizing extreme profits. With proper care willow-growing will pay quite as well as any crop usually grown in this country, and land of little value for ordinary culture can be made remunerative by this means.

The writer then furnishes an accurate account of the expenses of preparing the ground, price of cuttings, planting, weeding, rent, taxes, and cutting an acre of ground in England for three crops; but, as the prices of land, labor, and taxes differ so materially from those of this country, it would not afford much valuable information to the planters here.

The third year's crop may be taken as an average value of the ten following years, after which, unless great care is bestowed, there will be a slow but gradual diminution of produce. Taking these, however, as the data to reckon from, the actual profit at the end of twelve or thirteen years would be very considerable. There will, of course, be accidental or special circumstances which will, to some extent, alter the nearest calculation that can be made; for, as willows are liable to certain diseases, and also subject like other crops to the fluctuation of market prices, allowances must be made. With respect to diseases, which consist chiefly in the attacks of insects, much is in the hands of the cultivator. The cutting down to the ground, and leaving no lodgment for the larvæ, combined with cleanly cultivation, will do much towards warding off their attacks. Again, as in other crops, the damage done to willows extends over a large area, and when a more than usually bad season occurs an advance of prices takes place, and it not unfrequently happens that a bad crop is not necessarily a loss to the grower. Some varieties of willow are very little subject to the attacks of insects, and the prudent cultivator will carefully avoid the kinds that are so, and leave the more speculative man to grow the more precarious sorts.

No one must attempt to grow willows (unless of the bitter sorts) where hares or rabbits abound. Certain loss of capital will be the result of planting in such places. The rule has been to plant willows in any out-of-the-way corner, where nothing else would grow, and when planted take no further care of them. Such a system can never be made to pay, except for coppice-wood, and I should strongly advise no one to attempt cultivating basket-willows in such a fashion; but so little attention has been paid to the subject hitherto that there is a comparatively new and wide field open to the man of enterprise and ability.

The average weight of a crop of the best and harder kinds of willows would be in the green state about 6 tons per acre, and of the soft sorts or osier 7 or 7½ tons. At present prices the respective values would be, if sold green:

6 tons, at £3 10*s.* per ton	£21 0 0
7 tons, at £2 10*s.* per ton	17 10 0

If peeled the 6 tons would produce 2 tons of white willows, worth 16*s.* per cwt., and the cost of peeling would not exceed £7 0*s.* 0*d.*

2 tons of white willow, at 16*s.* per ton	£32 0 0
Deduct expenses for peeling	7 0 0
Produce of an acre	25 0 0

7 tons of osiers, if peeled, would yield—

2½ tons of white rods, at 11*s.* per cwt.	£27 10 0
Deduct cost of peeling	5 10 0
Produce of an acre	22 00 0

The quantity here stated as the average produce of an acre is not intended to apply to those weed-beds that are not more than half planted, but to an osier-bed under proper cultivation. It will be seen that the cost of peeling, and also planting osier, is not quite so great as that of the finer kinds, the rods being larger, and fewer cuttings required.

The above estimate is for a crop of one year's growth; for two-year old willows it is absolutely necessary to have osier, as no hard-wooded sorts make good two-year-olds, whilst osiers, as two-year-olds make a better return. By osiers is here meant the soft-wooded sorts, *Salix viminalis*, and its varieties, which are always called osier by basket-makers, in contradistinction to the finer varieties.

In cultivating willows for two-year-olds, if it is intended to allow them to stand upon the stools for the second year, all the small, crooked, or rough rods which are of little value should be pruned or taken away with the knife, and only the long, straight rods allowed to remain, by which means greater vigor is imparted to them; or, if the object be to extend the area of planted ground, they may be all cut down, the finest rods only being selected and stuck into prepared ground in their entirety, and left in that state to be cut off the following season, by which means an excellent crop of two-year-old osiers will be obtained, and the ground planted at the same time.

The chief points to be observed by the cultivator are, to keep his land clean and well worked, and to replace any failing root by sticking long rods in the ground, as before stated, thus keeping his land fully cropped. If any intending planter means to allow weeds and willows to strive for the mastery unmolested, and give no attention to the ground when planted, I should advise him to let willow-growing alone as a source of profit.

Another purpose to which the willow may be applied is well worthy of the attention of farmers in this country, where timber for fencing is

becoming so scarce and expensive. In England growers of osiers have adopted the bitter willow, in preference to thorn or osage-orange, for hedges. It is of very rapid growth, and because of its bitterness cattle will not injure it, and vermin will not destroy it. It forms a most perfect protection, and at the same time produces an annual crop quite as remunerative as that grown upon any other portion of the ground. The labor and expense of cutting down and keeping in shape the osage-orange, locust, or thorn-hedge is made an objection to its more general use, whilst the product of the willow will not only meet this objection, but make an additional profit. The writer gives the following instruction how to make a willow-hedge:

To form a good efficient willow-hedge the ground must be dug to a depth of 15 to 18 inches, and effectually cleared of weeds, and, if poor, manured; in fact, it is necessary it should undergo a similar preparation to what would be required if it were intended to plant a thorn-hedge. Should the ground be very low, and charged with stagnant water, it will be necessary to throw out a ridge to plant upon, for no willow will flourish in a swamp.

If it be desirable to form a hedge at once, willow stakes, 4 or 5 feet long, may be used, the ends of which must be sharpened and pushed 12 inches into the prepared ground, 6 inches apart, in a standing direction thus //////, and be temporarily wattled at the top, to hold them in position, until such time as they shall have fastened themselves by the spray which will grow up perpendicularly, thus www. Or, if it be preferred, they may be pushed in straight, and as the shoots put out at the sides they can be wattled together, and thus form a fence equally effective as the above.

Another method is to plant a double row, crossing them in the manner following xxx. These should be secured temporarily by a bast-tie, until by growth they become fastened in position. The above methods are the most expensive on account of the extra length of the cuttings required, and would, of course, only be adopted where it was required to have a hedge in the shortest possible time. The most economical mode is to plant cuttings taken from two or three year old shoots, and not more than 12 inches long; these should be pushed into the ground at the same distance apart, viz, 6 inches, or closer, if the hedge is intended to be game-proof, and at the end of the first year, if the shoots have not grown sufficiently strong, they should be cut to the ground, when the subsequent growth will be found strong enough to train into a permanent fence in any form that might please the fancy of the grower.

As regards the monetary value of a hedge of this description, my own experience leads me to estimate its annual produce, based upon a low calculation, at 5*s.* per chain. The weight of cuttings obtained from a hedge at Toton, 200 yards in length, and of two years' growth, which was cut February 21, 1871, amounted to 1 ton 15 cwt. 1 qr., and which, at the moderate estimate of 50*s.* per ton, comes to £4 8*s.* 1½*d.* In this case the fence was allowed to grow two years before cutting, as it was desirable to leave it as a screen for more tender plants; whereas, had it been cut each year, which would have been the case under ordinary circumstances, the crop would have been more valuable.

It should not be overlooked that, owing to the rapidity of its growth, a willow-fence forms an excellent shelter for plants and cattle in an almost incredible short space of time; whilst as a protection against game it possesses this advantage over every other description of fence, that, by attention, and getting it sufficiently close—which may readily be accomplished by interweaving the shoots—it can be rendered perfectly game-proof, for whereas rabbits would burrow under netting, the roots of the willow would present an insurmountable barrier to their ravages.

I should recommend a temporary protection of posts and rails, similar to that used for the defence of a thorn-hedge, but which would not be required so substantial, in consequence of the shorter time it would be necessary for it to remain, as, without some such safe-guard, it would, of course, be liable to be trodden down by cattle. A hedge so planted must be kept clear of weeds, and the soil maintained in a friable state, to admit of freedom of growth, until such time as it becomes perfectly formed, when no further attention or protection will be requisite. I should not advise the line of hedge-row to be encumbered with timber-trees, as they must, necessarily, stunt the growth of the hedge.

The description of willow I recommend for the above purpose is the *Salix kerksii*.

The substitution of willow for thorn in the formation of hedges is not, by any means, a novel idea, its peculiar properties, in this respect, having been noticed by eminent authorities for years past. The properties of the bitter willow are thus described by Miller, the well-known author of the Gardner's Dictionary. "The extreme bitterness of the leaves and twigs renders it valuable for many purposes; when used as a band or withe it is never eaten by vermin, nor, when formed into a hedge, is it browsed on

by cattle; even insects prey upon it much less readily than on the other species. In some parts of Yorkshire its twigs are used for making the finer sorts of basket-work." "By some observations I have made," says Mr. Curtis, "I should think it might be advantageously used for such purposes. Planting cuttings one year, by way of experiment, I found that this species gave the longest one year's shoots, exceeding even those of *S. vimnalis*." Linnaeus also recommends it for its toughness, and as a most excellent willow for the formation of hedges, and also as one of the best willows for the finer kinds of basket-work. Dr. Anderson advises its use as a fence for dividing any extensive field of rich ground into separate enclosures, and also remarks there is no fence which would be raised at such a small expense so quickly and continue so long.

Loudon, in his Arboretum and Fruticetum, page 1499, states that the inner bark of most of the kinds included in this group (*Purpureæ*) is extremely bitter, which renders the plants suitable for the banks of rivers and other places, which are infested by rats, as the bitterness prevents these animals from eating it. It is also frequently planted in Norfolk and Suffolk and in some parts of Essex for plaiting into close, low fences, for the exclusion of hares and rabbits, the bark and leaves being so extremely bitter that these animals will touch neither, while the shoots being long, tough, and flexible, may be formed into any shape; and a fence of this kind is reckoned little inferior to that of wire. This species is well adapted for planting in ornamental shrubberies, from the elegant slenderness of its twigs during winter, the redness of its catkins, the anthers of which are of that color before they burst, and the fine purplish and glaucous hue of its young shoots and leaves. The male plant, being the most beautiful when in flower, ought to be most propagated by nurserymen.

This variety of willow will produce shoots from 5 to 8 feet long in one season.

It will thus be seen from the above quotations that I lay no claim to originality, but, having simply carried out the ideas of these eminent writers to a practical issue, in a district swarming with hares and rabbits, I am in a position to bear ample testimony to the value of their remarks. I can, however, scarcely go so far as to say that hares and rabbits will not touch the very young shoots of this description of willow. Occasionally, when hard pressed for food, they may do so, but never to such an extent as to cause any material injury to the plant.

The Department of Agriculture deems this subject so worthy of attention that it will make an effort to procure, by importation, some of the most valuable willows, for gratuitous distribution, when the proper season arrives.

ENTOMOLOGICAL RECORD.

By Townend Glover.

The Colorado potato-beetle in the District of Columbia.—During the last month the much-dreaded western potato-bug, *Doryphora decem-lineata* made its appearance in the immediate neighborhood of Washington, D. C., several of the mature insects having been brought alive to the Department of Agriculture for identification. They were taken by Mr. Charles Chapin, of the Marine Corps, in a garden, feeding on the foliage of some potatoes, and had almost ruined the plants. Paris green mixed with flour, and dusted over the foliage, as yet appears to be the best remedy.

Paris green.—The Department has also received information that the same mixture of Paris green and flour, or plaster, has been used with good effect to poison the cotton-caterpillar, *Anomis xylinæ*, by sprinkling it over the foliage when wet with dew. Some of our southern correspondents, however, complain that the Paris green now sent out is a very inferior article, and on that account has proved ineffectual in many cases. As this remedy has been highly recommended by some, and pronounced worthless by others, we shall, therefore, be much obliged to our southern correspondents if they will write to the Depart-

ment the results of any experiments they have made with this poison, so as to gather together all the facts, that we may know whether it should be recommended next year, or condemned. Cotton being the great staple of the South, it will be plainly seen that great benefit would arise to the South by knowing the true facts in the case, and the experience of practical planters, before recommending any remedy that might prove worthless and perhaps injurious.

PHYLLOXERA VASTATRIX.—The grape-vine-root gall-louse, so destructive to the grape-vine in Europe, and found in the Western States, has been found on the grape-vine roots growing in the gardens of the Department of Agriculture at Washington. Mr. J. E. Planchon, of Montpellier, France, on his late visit to Washington, made a most thorough investigation of the grape-vines, and after examining sixty of the plants most thoroughly he found only from four to six of these insects alive on the roots. It is also to be observed that this year none of the leaf-gall species, known as the *Pemphigus vitifoliæ*, of Fitch, have been found on the foliage of the grape-vines at the Department, but the vines are very much injured by the small insect erroneously known as the grape-leaf thrips, which is a species of frog-hopper, (*Erythroneura*,) belonging to the order *Homoptera*, and which by sucking out the sap causes the foliage to assume a withered and spotted appearance, and, if very numerous, causes the leaves to be shed.

INSECT INJURIES.—Reports of extensive depredations upon the growing crops, by noxious insects, have been received from a large number of counties. The Entomologist would here earnestly reiterate the recommendation of the July report, and request our regular and casual correspondents to send to the Department specimens of injurious insects that may be operating in their respective localities. It is impossible, from the local names and imperfect description by which these are frequently designated in our correspondence, to identify the offending species. A single specimen would often enable the Entomologist at once to recognize the character and habits of the depredator, and to suggest effective means for its extirpation.

Grasshoppers, (*Caloptenus* sp.)—These insects have been very destructive, especially in the States and Territories west of the Mississippi River. It is evident that two species *C. spretus* and *C. femur-rubrum*, are represented in the accounts received at the Department, but from lack of specimens it is impossible to designate, in most cases, the species infecting a particular locality. New Hampshire is the only New England State reporting the presence of grasshoppers. In Carroll County the *C. femur-rubrum* continued to devour the crops until driven away by cool nights; in Sullivan these pests destroyed some fields of tobacco; in Grafton they infested some localities. They were also quite destructive in Chautauqua and Jefferson Counties, New York.

Both species have been active in the West and Southwest. Grasshoppers made their appearance in Bossier Parish, Louisiana. They were very injurious in Palo Pinto, Parker, and Atascosa Counties, Texas, to the grain-crops, and, in some cases, to the fruit. In Montgomery, Hancock, and Bradley Counties, Tennessee, they devoured the corn and grass crops. They appeared in immense swarms in Jefferson County, West Virginia. They appeared in Mahoning County, Ohio, and were more numerous than ever in Lorain; in Medina they were very destructive in pastures. They were no less numerous in Dubois and Newton Counties, Indiana, and threatened the grain and grass crops in Crawford, Lawrence, and Edwards Counties, Illinois. They

were especially mischievous to gardens, oats, and corn in Clarke County, Wisconsin, where they moved southward along a zone five miles wide. Their unwelcome presence was also felt in Murray and Faribault Counties, Minnesota, and they were numerous and voracious in Crawford, Pottawattomie, and Woodbury Counties, Iowa. Severe damages are reported in several counties of Missouri, Platte, Lawrence, Montgomery, Clay, and Saint Genevieve; in the latter the visitation was more disastrous than for twelve years past. They were blown away by the southwest winds in Marshall County, Kansas; they did some damage in Ottawa, immense numbers flying over the county; they were more or less destructive in Washington, Smith, and Doniphan. Their ravages were serious in Burt, Boone, Antelope, and Washington Counties, Nebraska. In Clay County, Dakota, they made such havoc with the promising field and garden crops that many farmers in that region are entirely discouraged and desire to sell out and move to some other locality. They were also very bad in Union, Lincoln, and Hanson. Montana reports destructive visitations of grasshoppers in Lewis and Clarke County, and also in Deer Lodge.

Colorado potato-beetle, (*Doryphora decem-lineata.*)—In New York the Colorado beetles made their first appearance in Ontario County, and effected more or less injury in Chautauqua, Erie, Seneca, and Wyoming. They are reported in large numbers in several counties of Pennsylvania, viz, Beaver, Westmoreland, Armstrong, Indiana, Elk, Huntington, Lawrence, Clinton, Erie, Cambria, Juniata, and Warren; in the last-named county they made their first appearance; in Westmoreland, after destroying the potato-tops, they attacked the tomatoes, and finally satiated their voracious appetites upon the *Datura stramonium*. They are reported in Austin County, Texas, and in Jefferson, Grant, Barbour, Tyler, Brooke, Nicholas, and Mineral Counties, West Virginia. In Nicholas it was observed that they left untouched the Early Rose and Peachblow varieties. In Kentucky they infested Jefferson, Scott, Shelby, Spencer, and Lincoln Counties. Sixteen counties in Ohio were subjected to their ravages in a greater or less degree, viz, Noble, Coshocton, Medina, Auglaize, Butler, Columbiana, Franklin, Granger, Licking, Lorain, Marion, Mahoning, Washington, Crawford, Lucas, and Van Wert. They were troublesome in several counties of Michigan, Lapeer, Calhoun, Jackson, Van Buren, Manistee, and Shiawassee. Indiana reports them in Scott, Decatur, Warren, Cass, Harrison, and Dearborn; Illinois, in Morgan, Sangamon, Pope, Putnam, Carroll, Rock Island, and Lee; Wisconsin, in Chippewa, Pierce, Greene, and Milwaukee; Minnesota, in Sherburne and Stearns; Iowa, in Clinton and Pottawattomie; Missouri, in Boone; Kansas, in Ottawa; Nebraska, in Boone and Thayer Counties.

The common black potato-bug (*Epicauta* [*atrata*] *pennsylvanica*) of Leconte is reported in Indiana and Elk Counties, Pennsylvania; Clarke County, Virginia; Crawford, Medina, Geauga, Lorain, and Lucas Counties, Ohio; Decatur and Dearborn Counties, Indiana. In the last-named county a new insect injurious to the potato appeared, which, from imperfect description, is supposed to be the *Epicauta* (*vittata*) *cinerea*. In many of the counties above enumerated very successful efforts were made to exterminate these insects by the use of Paris green and other poisons. In other counties these efforts were but partial, and urged with little resolution; such counties present a discouraging report. In Clinton County, Illinois, the lady-bug (*coccinella*) was reported as damaging the potatoes. It is very probable that this insect was merely hunting the eggs of the Colorado beetle, upon which it feeds voraciously. Farmers often, in this way, mistake their friends for their enemies.

Cut-worms, (*Agrotis* sp.)—A species of this genus injured the corn in Erie County, New York; another injured tobacco in Louisa County, Virginia; another was heard from in Lapeer County, Michigan.

Cabbage-worms (*Pieris* sp.) were destructive in Aroostook County, Maine, and Northumberland County, Pennsylvania. A worm like the common cabbage-worm covered the heads of the sorghum, when in full bloom, in Montgomery County, Tennessee.

Chinch-bugs (*Micropus* [*Rhyparochromus*] *leucopterus*) did more or less damage in Pittsylvania, Halifax, and Mecklenburgh Counties, Virginia; in Burnet County, Texas; in Russell County, Kentucky; in Adams County, Ohio; in Jennings County, Indiana; in Clinton, Pope, White, and Boone Counties, Illinois; in Greene and Dane Counties, Wisconsin; in Miller, Benton, Crawford, Lawrence, and Laclede Counties, Missouri; in Neosho, Bourbon, Montgomery, and Labette Counties, Kansas, and in Gage County, Nebraska. In Labette County, Kansas, they devoured the rag-weed.

Grub-worms (*Lachnosterna* sp.) were active in Atascosa County, Texas, and in Platte County, Missouri. In Monroe County, West Virginia, they honeycombed the meadows and pastures; in Mercer they badly injured the corn. It was probably the same insect that destroyed the growing wheat in Putnam.

Hessian-fly, (*Cecidomyia destructor.*) This insect has been heard from in Russell County, Kentucky, and in Jennings County, Indiana,

Wheat-midge, (*Diplosis tritici.*) This insect troubled small grain farmers in Mercer and Putnam Counties, West Virginia.

Boll-worms (*Heliothis armigera*) injured cotton-crops in Edgefield, North Carolina; in Upson, Marion, Twiggs, Stewart, Coweta, and Calhoun Counties, Georgia; in Jefferson County, Florida; in Saint Clair, Macon, and Perry Counties, Alabama; in Lowndes, Noxubee, and Rankin Counties, Mississippi; in Rusk County, Texas; in Columbia County, Arkansas.

Cotton-caterpillar, or army-worm, (*Anomis xylinæ.*)—The visitation of this pest has been one of great severity in the more southern cotton States. It appeared without doing much damage in five counties of South Carolina, Richland, Williamsburg, Laurens, Marlborough, and Orangeburgh. It was reported as not very injurious in Brooks, Lee, Muscogee, Macon, Worth, Glynn, Baldwin, and Twiggs Counties, Georgia; but its ravages were quite serious in Decatur, Schley, Marion, Early, Coweta, Calhoun, Jefferson, and Stewart. In Early County it is stated that those worms which had not webbed up were eating the young bolls. In Macon the caterpillar required a longer period for procreation and showed far less of destructive energy than formerly. A few persons in this county denounced the effects of poisons as worse than the injuries of the worms, but no specific facts were presented.

In Florida injuries were comparatively light in Jackson, Gadsden, Columbia, Alachua, Hamilton, and Suwannee Counties, but more severe in Jefferson, Liberty, Wakulla, Madison, and Leon. Experience varies in regard to Paris green and other poisons. In Liberty the worms appear to ignore and despise all efforts for their extirpation. In Madison few had faith enough to try any remedies. In Jefferson some were successful for the time, but complained that the worms returned after ten or twelve days. In Leon judicious efforts of this kind were quite successful.

In several counties of Alabama the caterpillar was quite active even

in July, the injuries being more severe on fresh bottom-lands. In Montgomery the pest appeared fifteen days earlier than last year. Severe injuries were experienced in Russell, Marengo, Macon, Dallas, Conecuh, Choctaw, Hale, Barbour, Henry, Clarke, Pike, Butler, Perry, and Autauga; the infliction was lighter in Crenshaw, Chambers, Wilcox, Coffee, Jefferson, and Green. In Franklin the caterpillar has never been known. In many localities Paris green and other poisons were used with variant success, but many had too little faith in their efficacy and too much apprehension of accidents to use them properly. In such cases the insects were only checked and not destroyed. In Perry and Dallas Counties poisons were used with satisfactory results when judiciously applied at an early period after the appearance of the worms.

In Mississippi caterpillars were noticed about the last week of July, though in Warren County they put in an appearance on the 6th. They lightly affected Newton, Rankin, and Wilkinson Counties, but were more numerous and destructive in Warren, Marion, Lowndes, Kemper, Clark, Washington, and Noxubee. Paris green and arsenic were in great demand in Marion, but their efficacy had not been decisively tested.

Caterpillars were reported in several parishes of Louisiana: Avoyelles, Cameron, East and West Feliciana, Tensas, Rapides, Madison, Franklin, Concordia, Carroll, Caddo, Bossier, Richland, Iberia, Union, and Tangipahoa. The most serious injuries were felt in Avoyelles, Caddo, Rapides, and Tangipahoa. In Avoyelles Paris green was extensively used, and its efficacy was awaited with special interest.

These worms were comparatively innoxious in several counties of Texas: Collin, Wood, Washington, Walker, Victoria, Uvalde, Matagorda, Fayette, De Witt, Burnet, Rush, and Blanco. They were more severe in Leon, Lavaca, Austin, Grimes, Liberty, Smith, Fort Bend, and Montgomery. In the last-named county half the crop was saved by the energetic use of poisons. Several specific preparations of Paris green were reported as successful in different counties. In Liberty County the worms were quite destructive upon red land, but seemed to avoid the crops on gray land.

In Union, Hempstead, Dorsey, Columbia, Drew, and Clark Counties, Arkansas, these worms were not very formidable, but they made their mischievous power felt in Polk and Ashley. A new cotton insect appeared in Jackson County, Georgia, boring into the forms and causing them to drop. *Per contra*, in Jackson County, Florida, an enemy to the caterpillar was observed in some unknown insect, which largely destroyed it.

Cotton-lice (Aphides) were more numerous than ever in Chowan County, North Carolina, and were quite troublesome in Camden, Pasquotank, and Perquimans.

Grass army-worms (Leucania unipuncta) swept the grass-crops of Edwards County, Illinois.

Horn-worms (Macrosila Carolina) injured tobacco-crops in Halifax County, Virginia.

Apple-worms (Carpocapsa pomonella) injured fruit very seriously in Lunenburg County, Virginia; in Cass County, Missouri; in Benton County, Iowa; in Jackson County, Kansas; and in Salt Lake County, Utah.

Fruit caterpillars (Clisiocampa sp.) injured fruit and forest trees in Haywood and Fayette Counties, Tennessee.

Curculio (Conotrachelus nenuphar) injured apples and peaches in Monroe County, West Virginia.

Borers (Saperda candida) were destructive to apple-trees in Grant County, West Virginia.

Rose-bugs (Macrodactylus subspinosus) were destructive to grapes in Strafford County, New Hampshire, and Woodson County, Kansas.

Currant-worms, of some undescribed species, injured the currants in Aroostook County, Maine.

MICROSCOPIC INVESTIGATION.

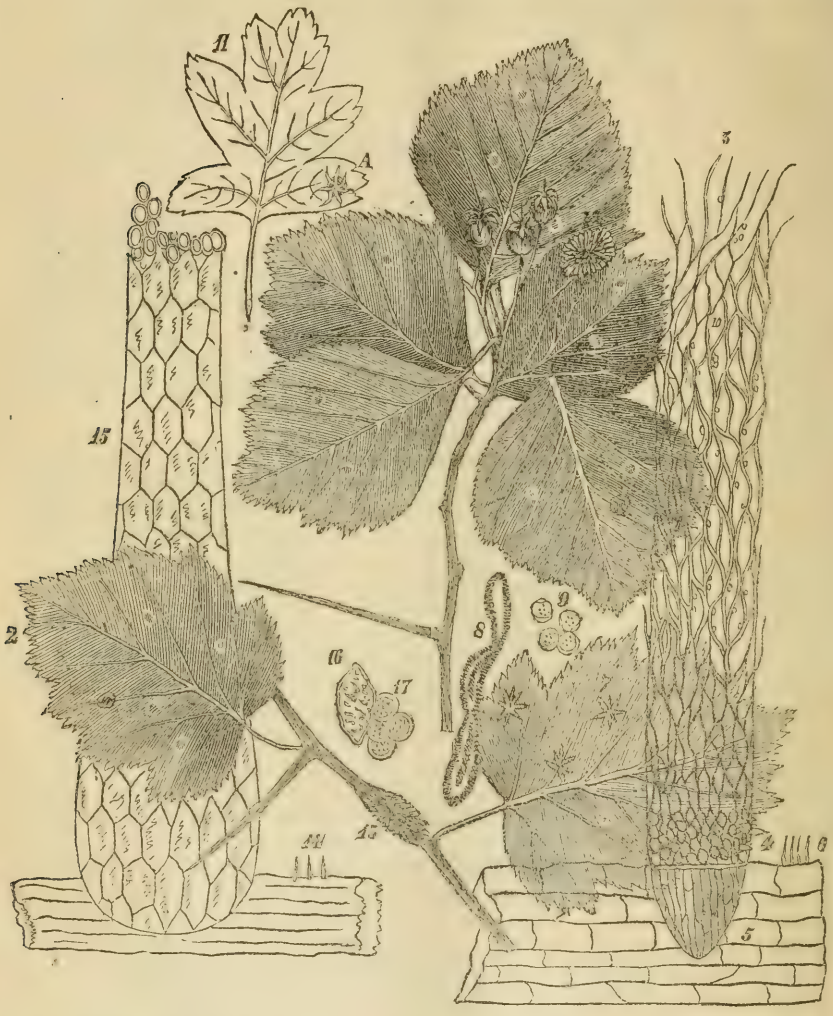
By Thomas Taylor.

Rœstelia lacerata, Tulasne; Æcidium laceratum, Grev.—Greville, in his Scottish Flora, p. 209, vol. iv, describes this fungus as it was known in 1826. He says that it is found on the nerves and petioles of the leaves, on the fruit, and even on the young branches of the hawthorn (*Cratægus oxyacantha*) in summer and autumn everywhere; and M. A. Cooke observes that it is found on the under surface of the leaves and on the petioles and fruit of the hawthorn, and is common from May to June in the United States.

My attention was called last year to the prevalence of this fungus on the hawthorn plants on the grounds of the Department during the months of July and August. This year it has also appeared. I first observed its presence in the month of July, although it may have appeared in June preceding. At this time, September 20, the fungoid forms are decaying. Nearly every variety of the hawthorn is affected, especially *C. punctata* and *C. tomentosa.*

The Washington evergreen hawthorn plant *C. pyracantha*, Pers., seems not to be attacked by any species of fungus of the order *Æcidiacei.* Judging from my observation I deem it an error to suppose that *Rœstelia lacerata* attacks either the branches or fruit of any variety of the hawthorn. We have many varieties of the hawthorn growing on the grounds of the Department, but in no case have I found *Rœstelia lacerata* on their fruit or branches. This species is confined to the leaves in every instance, and the petioles thus far are exempt from its attacks. On making my first observations and dissections of the orange-colored fungus, seen so frequently on the branches and fruit of hawthorn-bushes, I was much disappointed on finding that the color, structure, &c., of the peridium and spores did not agree with that given by mycologists; but on making search to ascertain if any other similar genus or species of the order *Æcidiacei* existed on the hawthorn *C. oxyacantha*, or on any of the numerous varieties of this hedge-plant, with the view of accounting for the discrepancy, I found, on turning up the leaves having orange spots on their upper surface, true peridia (sacks) of *Rœstelia lacerata*, Tul.: *Æcidium oxyacantha*, Pers. Under a power of about 90 diameters the general character of the peridia is seen. They are densely aggregated, elongated, submersed, pale-brown, irregularly torn. The sporidia are copious; thus far agreeing with Greville's description. The circular spots on the leaves, Nos. 1 and 2, indicate the general points of growth of this fungus. I find it frequently on the leaf-ribs and terminal points of the leaves, and very often dispersed over the smooth parts of the leaf; sometimes, although rarely, the peridia are on the upper surface of the leaves. 3 represents the peculiar formation of their structure, which resembles net-work. At the juncture of the leaf (see

4) the cells of the peridia are nearly round; at 5 oblong. From 3 to 4 the cellular structure is of a light vandyke brown; at 5 a pale yellow. I am aware that the structure of the peridia, as described by me, varies



in some respects from that by Greville and others, which shows the importance of photographing so minute objects. I have presented sections of these for future use. 6 represents the appearance of the peridia as seen by the naked eye; 7 their general arrangement and their groupings on the leaves; 8 three cells, showing the parts of which the peridia are composed when magnified about 125 diameters; 9 the spores contained in the bottom of the peridia, magnified 125 diameters; 10 represents the openings or meshes; 11 a leaf of a variety of *C. oxyacantha.* On one of its lobes, at A, is represented a cluster of peridia of a species of *Æcidium,* heretofore undescribed as a parasite on the hawthorn, or it may have been confounded with that on the leaves; 14 represents

peridia as they appear to the naked eye; 15, a very highly magnified view of one of them, the cells of which are magnified 125 diameters; 16 one of the cells somewhat more highly magnified. They are not always regular in construction, although generally of the form given. They separate easily from one another by slight friction. 17 represents spores* of an orange color, with which the peridia abound, and which consist of at least three parts: first, a transparent outward cell, which contains an orange-coloring matter, within which may be seen germinal matter in the form of dark spots. The spores are magnified 125 diameters.

All standard works on mycology represent *Rœstelia lacerata* as the only fungus of the order *Æcidiacei* that attacks hawthorn plants; but judging from my investigations, it holds a secondary place. So conspicuous are the species of the two genera on them, the one on the leaves, the other on the branches and fruit, that the naked eye can distinguish the difference. That on the leaves appears of a brown color. Owing to the transparency of the cells of the peridia, the brown coloring-matter of the protospores being seen through them, while that on the fruit and branches appears of a rich orange, owing to the color of their protospores. Although of the same order they differ in genus and species.

It is of much importance to ascertain as far as possible the conditions of growth favorable or unfavorable to this order. Its presence on plants is highly destructive to them, and has proved one of the most serious obstacles to the cultivation of the hawthorn as a hedge-plant in the United States. Forty-seven species of *Æcidium* and three of *Rœstelia* are reported by M. C. Cooke. In relation to the ravages of this order of fungi P. H. Foster, proprietor of Babylon nurseries, Babylon, Long Island, writes to the Commissioner of Agriculture, on the 1st of August last as follows:

> I send you a specimen of a disease which occurs on some American white-ash trees, which I imported from Flushing, New York. I have noticed the disease on them during the last two seasons. It first makes its appearance early in the season on the leaves, and finally attacks the young wood, as may be seen on the specimens enclosed. It is evidently of fungoid origin. I have many thousands of plants of American white-ash, from two to three years old, planted in my nurseries, none of which are affected with this disease. I have also some European ash, which appear to be very susceptible to it. I wish to obtain a remedy. The loss of so valuable a timber-tree would be too great for our country to bear.

The Department will at an early day commence a series of experiments, having relation to the best mode of treatment of plants affected with this fungoid form of disease. The results of the experiments will be published in the monthly reports.

THE LINEN INDUSTRY IN SILESIA.

The culture of flax and the manufacture of linen in Silesia are of the greatest value among the industries of that important section of the German Empire. The linens of Silesia have long been celebrated for their fine and desirable qualities. In bleaching, what is called the "gentle process," in contradistinction to the usual chemical process, is inva-

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*Protospores they should be called, because, in fact, they germinate, and on the threads thus produced the true spores or fruit are borne.

riably used. By this process the cloth is generally three or four months in bleaching, and the lyes are very mild and moderately used. To this fact the reputation which Silesian linen enjoys in this country is perhaps largely indebted. The country people are the manufacturers of the linen as well as the cultivators of the flax, the former being still carried on, as it was centuries ago, in the primitive method, with little aid from machinery. The flax is grown by small farmers, spun on the common hand-wheel by their wives and daughters during the winter, and woven in the houses of the peasants, chiefly by farm laborers when not engaged in field work. It affords but a scanty subsistence, but is, nevertheless, the chief occupation of the country people. It is found, however, that the intermixture of agricultural and industrial pursuits is not conducive to good farming, and it is only in the purely agricultural districts that the better and more profitable system of culture prevails. The peasantry, such of them as are owners of small farms—and many of the farms are from eight to twelve acres only—are in one respect richer than the large land-holders. They are generally not in debt, while the great estates are most of them mortgaged to about 50 per cent. of their value.

The vast consumption of linen by both belligerents of the late war in this country, and also of the late French-Prussian war, stimulated an active demand and very remunerative trade in the flax-producing and linen-manufacturing countries of Europe. A reaction succeeded those wars, and the acreage under the plant has been so much reduced that the production is scarcely equal to the requirements of the trade. Russia is the great flax-producing district of Europe, while Silesia is a leading linen-manufacturing country, especially for the finer fabrics. The production of flax in Silesia is wholly inadequate to the demands of the linen-manufacturers of the province, who are largely dependent upon Russia for their supplies of the raw material. Although the cultivation of flax has been much increased in Russia of late years there is but a slight available surplus for exportation; for there, as in Silesia, the flax manufactures constitute a very important textile industry. The cultivation of flax is increasing in France and Belgium, but not in the ratio of the demand for home consumption. The production in the United States in 1870, according to the ninth census, was 27,133,000 pounds of flax and 1,730,000 bushels of flax-seed. But here flax is cultivated almost exclusively for the seed. The following translation from the Paris Annals of Commerce contains some interesting statements respecting the culture of flax and manufacture of linen in Silesia:

Of all the industries of Silesia, that of flax, the oldest in date, is at the present day the most important. From time immemorial Silesia has produced famous linens, and not long since she exercised in Germany a kind of monopoly for the fabrication of this tissue. In the province of the Rhine important towns, as Brilefeld, manufacture linen almost exclusively, and their products bear a striking resemblance to those of Silesia. The annual sum total which this employment produces is far from being unimportant, since the last statistics, published in 1871, for the three districts of Reichenbach, Schweidnitz, and Waldembourg alone, that constitute the division called "L'Eulengebirge," manufactured about 500,000 pieces of linen. Seven millions fifty-six thousand pounds of flax were employed, five million six hundred thousand pounds of tow, and fifty thousand shocks of linen yarn, a shock being about sixty pounds, were produced.

Although "L'Eulengebirge" is the principal seat of the industry of Silesia, it is not the only one; the product is also manufactured in the mountainous districts of the Austrian frontiers, which are called the "Riesengebirge," and which extend as far as "L'Eulengebirge." There, in most of the villages, the major part of the population, men and women, and even children, devote themselves exclusively to this industry. In "L'Eulengebirge," in 1871, there were 15,326 weavers and 13,164 hand-looms, 3,047 of which were used in the linen manufacture, 8,705 in the cotton manufacture, 559 in

woolen manufacture, and 773 in the manufacture of various other materials. The mechanical looms numbered 1,388. Yarn was bleached to the amount of 336,000 pounds. The principal establishments of Silesia are—

1st. The Royal Factory (Koenigliche Seehandlung) of Erdmansdorf, which devotes 8,450 spindles to flax, and 5,190 spindles to tow, and employs 800 workmen, producing 16,000 shocks of linen yarn, and 11,000 shocks of tow thread. The flax used in this establishment is principally obtained from Russia, Moravia, Saxony, Silesia, and Westphalia. Besides the 800 workmen employed in the factory, work is given to about 2,000 outside laborers. In 1871 this factory produced 4,500 pieces of linen.

2d. The Royal Factory of Landshut, with 7,400 spindles, employs 460 workmen, consumes 672,000 pounds of flax, 1,232,000 pounds of tow, and produces 14,000 shocks of yarn.

3d. The factory of the brothers Albert, at Waldembourg, employs 4,000 spindles, 400 workmen, consumes 1,456,000 pounds of flax and tow, and produces 9,000 shocks of yarn.

There are also five other factories of minor importance: that of Petzhold and Hofmann, at Waldembourg, employing 300 workmen and 4,000 spindles; that of Websky, at Tannhausen, 250 workmen; those of Held, at Friedland, Falki, at Liebau, and Vialard & Co., also at Liebau. The two latter use steam-machines, and run 20,000 spindles.

In "L'Eulengebirge," therefore, there are eight large linen manufactories, employing 50,000 spindles.

We should mention the village of Greiffenberg, which manufactures yearly about 120,000 dozen of handkerchiefs, which are sold not only in the States of the Zollverein but also in Norway and Switzerland. Formerly it carried on an important trade with Russia, which has completely ceased.

Besides the workmen employed in the factories, the linen industry gives employment to a great number who work in their own dwellings; some of these are employed for the year, others only during the dull season. In the district of Reichenbach there are villages, like Langenbielau, Peterswaden, Ernsdorf, and Haberndorf, where the whole population work in flax, either at home or in the factories. The work pays by the job. In the factories the workmen ordinarily get $2½ to $4 per week. The workmen at the Jacquard loom earn more. With this modest salary, these mountaineer families, that are generally numerous, can with difficulty earn a subsistence, even when their labor is uninterrupted; for this reason all the women, old men, and children above the age of six years are employed in spooling. The most skillful spooler can earn but twelve cents per day.

Warping affords an occasional resource. It is generally performed by girls. They can earn from $1½ to $2 per week.

The average weekly salary of a family, all the members of which labor from morning to evening, is little more than $5, or $260 a year.

It is surprising that large families can live on so small an income, and that whole populations manifest a singular attachment to so unremunerative an industry. From time immemorial the trade has been transmitted from father to son, and it is rare that the children ever seek to learn another trade, although the life of these unfortunate beings is only one of deprivation. If we deduct the modest rent of $14 or $20 for a chamber or attic, from the annual income of $260, there remains to each family only $220 or $230 to expend for food, clothing, fuel, and incidental expenses. The only aid the government allows these working people consists in gratuitous primary instruction.

The Silesian manufacturing companies employ one-fourth of the whole number of power-looms used in Germany.

The greater portion of the products manufactured in Silesia, the yarn as well as the linen, is consumed in Germany. Large quantities are, however, exported to Austria, Russia, Sweden, Denmark, and even to the United States.

The year 1871 was not generally favorable to the linen industry in Silesia. It felt the reaction of a war that had just terminated, and the want of hands, and especially the need of fuel (it being difficult to transport coal by railroad) forced many establishments to stand still. Raw materials also rose in price. Flax increased to $2½ per hundred-weight. Fortunately most manufactories had a supply of yarn, which, as workmen could not be procured, had not been woven, and by reason of this circumstance they were able to resume work and to support the high price of the raw material without proportionally increasing the price of their manufactures.

The culture of flax is pursued on a great scale in Silesia. About 50,000 acres are devoted to this cultivation, producing, on the average, 339 pounds to the acre, making a total of 16,950,000 pounds. This culture is carried on principally in Upper Silesia, and on the right bank of the Oder. Of the 16,950,000 pounds of raw flax produced in Silesia, about 1,000,000 pounds alone enter into general commerce; about 500,000 pounds are sold at the principal markets; the remainder is either delivered directly to manu-

facturers, or is retailed upon the premises. Generally, producers prefer to sell on the spot, and this custom makes a ready sale for the best qualities, for in 1871 flax sold on the premises was worth from $26 to $27, while that sold at the different markets only reached a price of from $20 to $22 a hundred-weight. The principal flax markets of Silesia are those of Breslau and Konstadt.

TEA CULTIVATION AND MANIPULATION.

The Department of Agriculture has always been interested in the development of this cultivation, and has not abandoned the hope that the tea-plant may ultimately be included with the domestic and economical products of this country. The high price of labor, and the mystery in which the matter was shrouded, until the British government undertook the cultivation in their Indian possessions, made almost any attempt at manipulation on the part of private parties a forlorn hope.

The adaptation of various sections of this country to the growth of the plant has been abundantly demonstrated, and plants from seed grown in the Southern States have, from time to time, been raised by the Department for distribution. So far back as 1848 the late Dr. Junius Smith abundantly proved that the mountains of South Carolina would produce and mature tea, although it was there subjected to severe freezing, and heavy falls of snow. Even in the grounds of the Department at Washington the plant has passed through the late severe winter without having been absolutely killed. It will be the object of this article to give such details and particulars relating to climate, soil, culture, and manipulation, as will tend to induce those who have already received plants, and have them growing, to experiment still further, and, it may be hoped, also encourage others to plant.

In the present state of the labor market we cannot expect to proceed on the plan of the British in the East Indies and establish large plantations. It would not pay to do so; but the intelligence of the farmers of this country, and the improved agricultural machinery in use, will render completely easy here what proved an insuperable difficulty in India, viz, the growing of tea for family use. The apathy of the Hindoo races, their dislike of anything new, and the fact that tea is not their popular beverage, militated against the production of tea for their own wants in anything like a general system. Isolated points occur where they acquire a taste for tea, and then they grow and manufacture it very well, but they cannot accustom themselves to cultivate it with any care.

The following suggestions are from a communication received from Mr. James McPherson, as the result of his own observations in India:

CLIMATE SUITED TO THE TEA-PLANT.—There are two very well marked varieties of the tea-plant, if indeed they are not sufficiently distinct to be ranked as species. These are, *Thea Assamica*, and *Thea Chinensis*, (syn. *viride*.) The first of these is the one with which western people became last acquainted, and it occupies a somewhat different position, naturally, to that in which the Chinese plant is usually found, if indeed the Chinese plant has even been seen in other than a state of cultivation. The varied conditions in which the two kinds, with their innumerable varieties, are found, may sufficiently account for the difference in their appearance. *Thea Assamica*, the India species, is usually found growing wild (and able to reproduce itself from seed) along the margins of the Assam forests, frequently manifesting a partiality for the banks of streams. The climate of Assam is tropical, and, in parts, very moist, and frost is almost unknown in its tea-gardens, while the average temperature is about 70°, and the rain-fall about 80 inches. The tea, like the wheat-plant or the vine, has, however, a remarkable adaptation to a very great range of climate, and I have known tea grown with perfect success where the mean annual temperature was only 58° Fahr. and the rain-fall from

30 to 50 inches. Perhaps it will reach its greatest perfection where the mean annual temperature ranges from 60° to 65° Fahr. and where the rain-fall, or what is quite as important, the humidity of the atmosphere, is considerable during the growing season, which, in northern latitudes, usually begins in March. Considerable heat, and foggy, cloudy weather, constitute what is known as a "fine growing time" for the tea-plant. Moisture in the air, rather than moisture in the ground, seems to be requisite. Situations which are exposed to severe frost should be avoided, since it will entail too much labor to protect the *young* plants.

Tea cultivation has been introduced, with more or less success, into British India, Ceylon, Cape Colony, Natal, the Australian Colonies, Saint Helena, Java, Réunion, Rio Janeiro, and the West Indies, and although these climates will grow the plant, yet the manipulation of the leaf has hitherto been so little understood that only two of these countries can claim tea as among their leading productions. India and Java export quantities, but the bulk is the produce of vast estates, under managers who very frequently know comparatively little of the industry, and yet make marketable tea.

Soils.—Almost any good, free soil, upon which water does not stagnate, will grow the plant. A good garden soil will produce tea in perfection, but it will be best to describe a tea soil as a sandy, chocolate-colored loam, containing an abundance of humus or decaying vegetable matter in a fit state for absorption by the roots.

Propagation by seeds and cuttings.—The first thing for the experimental grower is to understand the best manner of raising his plants. This is simple, the only precaution necessary being to use fresh seed. If tea seed is kept for any length of time out of the ground it turns rancid, as the chestnut and many other oily seeds are apt to do. Ripe seed is known by its dark chestnut color. As soon as procured it should be laid upon a hard surface and covered with 2 or 3 inches of rotten leaves, decayed hops, or almost any convenient vegetable material. In this position the seed will germinate, and when the sprouts are 2 or 3 inches high the young seedlings may be transferred to beds much in the same manner as market-gardeners prick out celery plants. The plants may be set in nursery-beds at 3 or 4 inches apart, according to the time they may possibly remain. If they are "pricked out" into beds in the spring, to be finally planted out in the fall, or in the fall to be planted in the spring, 3 inches will be ample; much will depend upon the time when the seed is received; if, however, the plants are likely to remain in the nursery-beds for more than six months, it will be best to allow 4 inches between plant and plant. An easier method is simply to plant the seed in the beds in drills from 1 to 2 inches deep and 4 inches apart, in a half shady position; but vacancies from bad seed cannot well be avoided by this plan. By germinating the seed a full nursery is obtained with very little extra labor. The seed may also be planted in hills, as gardeners plant melons, the hills being 5 feet apart. But here they must be weeded all the time, and as an acre of ground would have to be gone over for some 1,742 plants, much extra labor will be entailed by this method of planting the seed where it is to remain. Better to treat it as cabbage, nurse in beds, and afterward plant out. It may be useful to suggest here that it would be well for the nurserymen to turn their attention to the raising of tea-plants for sale in the localities where they are known to thrive.

The only attention a bed of young tea-plants requires is the routine work of weeding, occasional watering in dry weather, and possibly light shading with branches of trees in leaf, cut into lengths of about a foot, and stuck among the plants until they become established. If the pricking out or planting out is done in cloudy, showery weather, this labor may be saved. The propagation of tea by cuttings is a tedious and often very unsatisfactory process. The writer has put down many hundreds of thousands of cuttings, with the view of perpetuating superior varieties. The returns of rooted plants varied with the season from 10 to 75 per cent. This method of propagation is expensive, tiresome, and unsatisfactory. A much better plan will be to secure a good pure lot of plants and keep them separate as much as possible. I would suggest the propriety of the Department of Agriculture, and others who have the distribution of plants in their hands, sending one "strain" of plants alone to given localities as much as possible: the Assam kinds to hot and moist localities, and the Chinese type to drier and more elevated situations. The system of selection which has been practiced with such success in the case of corn, tomatoes, and other plants should be carefully attended to in the propagation of tea.

The preparation of the soil.—The preparation of the soil for tea should be precisely the same as the preparation for any other farm crop. Secure the best possible tilth, manure well, preferably with vegetable manure. A crop of any cheap seeded legume plowed in would be excellent; but any available manure in which straw is incorporated would answer. Plow deep and well; even subsoil, where the experiment is intended to be thorough, and the land will bear it. Harrow and cross-harrow. Mark out the land 5 feet by 5 in straight lines, as for corn, and it is ready to receive the tea-plants, which plant at the intersections of the scoring. Or, if it be determined to grow the tea with some other crop, for instance, onions, turnips, tomatoes, melons, cucumbers, peanuts, low-growing peas, celery, or almost any crop which will not shade

the plants, then the latter may be planted either as subdividing hedges at any distance apart to suit the taste, or they may be planted within the fences. This plan is very extensively practiced by the Chinese, and is a great economy of labor, since then the tea needs scarcely any special cultivation other than that given to well-kept hedges generally. The plants may be almost any distance apart in the rows, between one foot and four. The hedges may be clipped, but a flat top is the most productive form as regards yield of leaf. I am supposing that from one to five hundred or more plants are to be planted for family use. When fully started the plantation of tea merely requires to be kept moderately well weeded, and in no case must weeds be allowed to overtop and shade the tea; it is a crop requiring the full sun.

PLANTING.—No especial directions are necessary further than to say that the plants must, if possible, be planted in the spring, in showery weather, and not too deep; any one who can plant a garden with success, can manage a tea-plant. A little shade may be useful if hot, dry, sunny weather ensues; a few small boughs, stuck around the plants, are all that is needed to prevent intense evaporation from the soil and plants. I may mention that in deep soils the tea-plant has a tendency to form a long, bare tap-root, somewhat resembling a root of salsify or carrot. The directions given as to germinating the seed on a hard bottom were intended to obviate this tendency to form a long tap-root, and start the plant in the way it should go, forming fibrous roots; but if perchance a long tap-root is formed in spite of all precautions, then, in transplanting, it must be got out as entire as possible, and more care will be necessary until the plant has commenced to make new roots and growth in its new position. The kind of culture required while the tea-plants are reaching utilizable condition may be almost entirely performed by horse-labor, if the tea is grown in with other crops.

Fig. —.

I am not urging the formation of extensive plantations as yet, and, consequently, I cannot pretend to regard the setting out and tending of an ornamental hedge as anything but very pleasant pastime for the intelligent farmer in his leisure hours. The base of the plants should be kept free of weeds, and when 6 inches of growth is made, the extremities of the shoots and the terminal bud and three leaves below should be pinched out; if this pinching is done in the growing season the operator will not only be bringing his tea-bush into a spreading shape by the process, but will also be taking off the very article which goes to make the bulk of the teas of commerce. This pinching of the 6-inch shoots should continue until the plants reach their third year, when a sufficient quantity of leaves will be obtained for manufacturing purposes.

The accompanying sketch will fully illustrate the pinching or picking process, together with various qualities of leaf employed in the manufacture of the pure teas of commerce:

BLACK TEAS.	GREEN TEAS.
1. Flowery Pekoe.	Flowery Pekoe.
2. Pekoe.	Young Hyson.
3. Pekoe Souchong.	Hyson and Gunpowder.
4. Souchong.	
5. Congou.	Twankay.
6. Brick teas, &c.	Brick teas, &c.

The shoots marked *o o* should be left at the base of all current growths for the production of future crops, and be allowed to grow to at least 6 inches before they are picked. The black lines below the leaves show the point at which the various grades of leaf should be separated.

PICKING OF THE CROP.—When the shrubs are about three years old there will be a sufficient quantity of leaves obtainable to warrant a muster of the women and children of the farm, each of whom should be instructed to nip off the young and tender growth with the finger and thumb, at the point indicated by Figure 4 of the sketch. The three leaves and terminal bud, together with the tender stalk, make the very finest class of Souchong teas, often ranking, if well made, as Pekoe Souchong, and worth at least $1.50 per pound. If a coarser tea is desired, the young growth may be nipped out at the point indicated by Figure 5 of the sketch. Some may question the propriety of picking the stalk, but it is as tender as the leaves, and is invariably used except in Caper and Gunpowder teas. The leaves may be gathered in the apron or anything else; there is no more mystery about the matter than there is about gathering pease, or any other crop, it being only necessary to select the young growth, for the coarse leaves are not worth gathering; they will not make good tea, but the reverse.

Having briefly treated of the picking process, I will give a variety of methods by which both green and black teas are made. It takes on an average four pounds of raw leaf to make one of tea.

BLACK TEAS.—*Process No.* 1.—1. Picking the leaf; 2. Spreading two inches thick on mats, &c.; 3. Tossing in the hands, (as hay;) 4. Tossing on flat trays; 5. Examine for bruised red spots; 6. Place thin on mats, &c.; 7. Cover with cloth until fragrant; 8. Roasting on pan; 9. Rolling under the hands; 10. Drying over charcoal.

Process No. 2.—1. Picking the leaf; 2. Spreading out thinly; 3. Tossing in the hands; 4. Roasting; 5. Rolling; 6. Roasting; 7. Rolling; 8. Roasting; 9. Rolling; 10. Partial drying over fire; 11. Exposure to the air; 12. Picking out coarse leaf; 13. Final drying; 14. Packing.

Process No. 3.—First day and night: 1. Picking the leaf; 2. Spreading out thinly. Second day and night: 3. Exposure to air and tossing; 4. Roasting at 180° to 200° Fahr.; 5. Rolling out juices; 6. Roasting on pan at 160°; 7. Rolling out more moisture; 8. Spreading out thinly. Third day and night: 9. Partial drying in sun or otherwise; 10. Picking out stalks, &c.; 11. Final drying. Fourth day, if convenient: 12. Sifting out dust, &c., 13. Packing.

Process No. 4.—First day and night: 1. Picking the leaf; 2. Spreading out thinly. Second day and night: 3. Exposure to sun, turning over, tossing, and picking out of coarse leaves; 4. Panning, at 180° to 200°; 5. Rolling out juices; 6. Fermentation in heaps; 7. Spreading thinly. Third day and night: 8. Partial drying; 9. Picking out stalks; 10. Final drying. Fourth day, if convenient: 11. Sifting; 12. Packing.

Process No. 5.—1. Picking the leaves; 2. Wither in sun two hours; 3. Cool in shade one-half hour; 4. Toss and clap in hands ten minutes; 5. Cool one-half hour; 6. Toss ten minutes; 7. Cool one-half hour; 8. Toss ten minutes; 9. Roasting or panning; 10. Rolling; 11. Roasting; 12. Rolling; 13. Final drying; 14. Packing.

Process No. 6.—1. Picking the leaf; 2. Roasting; 3. Rolling; 4. Exposure to the air; 5. Final drying on the pan; 6. Picking out coarse leaf; 7. Sifting; 8. Packing.

GREEN TEAS.—*Process No.* 1.—First day and night: 1. Plucking the leaf; 2. Roasting on pan, at 200°; 3. Rolling thoroughly; 4. Expressing the juice; (give it a squeeze in a cider-press!) Second day and night: 5. Slight evaporation of the juices in the sun or on the pan; 6. Drying on the pan, constantly stirring as the operation proceeds; the pan should be heated to 180° and allowed to get gradually cooler as the operation proceeds; 7. Picking over; 8. Winnowing or sifting; 9. Packing.

Process No. 2.—1. Plucking the leaf; 2. Roasting; 3. Rolling; 4. Expressing the juice; 5. Spreading the leaves thinly; 6. Partial drying on pan; 7. Sifting; 8. Spreading out thinly; 9. Final drying on pan.

Process No. 3.—1. Plucking the leaf; 2. Cooling, by spreading thin; 3. Roasting, at 150°; 4. Rolling; 5. Exposure to the sun; 6. Expressing the juice; 7. Final drying on pan; 8. Picking out yellow leaf; 9. Sifting and classifying; 10. A hotter pan than the above is usually desirable.

Process No. 4.—First day and night: 1. Plucking the leaf; 2. Roasting; 3. Rolling. Second day: 4. Exposure to the sun; 5. Rolling on trays meanwhile; 6. Drying over charcoal fires if still wet; 7. Drying on pans heated to 150°, gradually cooling as the process proceeds to 140° and 130°; 8. Sifting. Third day: 9. Finally dry on the pan until the desired color is obtained; 10. Pack while hot.

Process No. 5.—First day and night: 1. Plucking the leaf; 2. Spreading out thinly. Second day and night: 3. Panning for four or five minutes; 4. Rolling; 5. Partial drying in the sun or over charcoal fires; 6. Pressing out the juice; 7. Partial drying on pan for some two hours; 8. Press or squeeze the leaves in a bag so as to thoroughly get rid of the juices; 9. Further heating on pan to evaporate moisture. Third day: 10. Final drying on pan for six, eight, or more hours, until the required color is produced; 11. Sifting; 12. Packing.

The foregoing methods have all been practiced by the writer, and they will all produce first-class tea in certain conditions of the weather. No two days' work can be precisely alike as to the *time* the various operations require, no more than the operations of the hay-field occupy precisely the same time from year to year, but this is not

important. The great thing to understand at the outset is the principle of tea-manipulation, and this once mastered the practice may be modified to suit every one's circumstances.

The difference between black and green teas is entirely due to manufacture. Black tea is subjected to the oxidizing influence of the atmosphere, often for a considerable time; great chemical changes ensuing. The tannin, volatile oils, extractive matter, and sometimes the thein are very much toned down.

Green teas undergo great changes also, from the raw state, but the preservative qualities of moderate degrees of heat are brought to bear upon the leaves before they have been acted upon by the atmosphere, and the above chemical constituents, together with the coloring matter, are better preserved than in the black teas. Black teas are bruised, beaten, and tossed before drying; green teas are not. Black teas are like a well-bruised apple, laid over for a day or two and then dried in an oven. Green teas are like a sound one, dried in like manner. These are the chief differences; but to make the matter more plain it will, perhaps, be best to briefly state the method of procedure and the utensils required.

Tea for family use, either black or green, may be made if the farmer or other operator can muster a cook-stove, or even a fire on the floor, and a brick or two, over which to set an iron or block-tin pan, measuring 2 feet 4 inches in diameter and 7 inches deep; this is, perhaps, the most convenient size, but a smaller will answer perfectly well as long as the hemispherical form is maintained. This is the roasting-pan, and in it the raw leaves are heated so as to cause them to exude their moisture. The pores of the leaves open with a series of miniature explosions, causing a sharp crackling sound; this is a tolerable test of the heat; that is, the leaves should crackle, but unfortunately they will do so when the pan is red-hot and liable to burn out all the goodness from the leaf.

Whatever heating medium may be employed, whether sun, or fire, or their combinations, the leaves should be perfectly soft and pliable before they can be rolled without breakage. They should be moist enough to stick together. When in this state the leaves are thrown on a table on which a bamboo or rattan mat is nailed. The Indian matting used for covering floors will answer, or the table may be shallowly grooved. A board to be worked by the hands may be grooved in the opposite direction, the whole arrangement being somewhat like a pill-making machine on a large scale. Or a machine (of which there are several) may be used, where the operations are sufficiently extensive to warrant its use, for—

Rolling.—This process has probably attracted more attention than any other part of the manufacture. The object is really to extract and press out the bitter juices, (probably tannic acid, &c.,) and it accidentally happens that the leaf receives the various twists seen in commercial teas. The Chinese manage this rolling almost entirely with the hands and feet. A ball of leaves is taken in the hands and rolled backward and forward, on the table, the pressure used being considerable; the leaves should become quite saponaceous, and when quite a quantity of juice is pressed out, and the leaves twisted, they may be pronounced properly rolled. It is a good plan to shake them out thinly after rolling, that the action of the air may evaporate the juices; and, in the case of black tea, oxidize the leaf. Some operators allow the leaves to stand in balls for a time, others warm them on the pan again; some place them in the sun, others in the shade; some place them in heaps to ferment, both before and after rolling. In short, the various methods by which good tea may be made are simply innumerable, but the principles of desiccation and manipulation must not be violated. What those principles are must in nearly every case be determined by practice; for beyond the recapitulation of the process as given, little more is known. I have frequently proposed the analysis of the leaves of tea in their raw state to the government chemists in India, but I believe it has not yet been undertaken; consequently the effect of exposure, heat, and pressure upon the leaves can only be conjectured. It would probably aid the inquiry very materially if a good manipulator could co-operate with a careful analytical chemist, who, for the sake of science, would be willing to investigate the various changes produced by manufacture.

The business of the farmer, after rolling and expressing his tea in various ways, suited to his fancy or convenience, will be finally to dry it over charcoal fires or on the iron pan. The latter will invariably produce a tea of stronger quality, partaking more or less of the characteristics of a green tea, even though black in color. When the tea is thoroughly dry it may be packed in wooden or tin boxes, always taking care they are perfectly dry and air-tight.

THE BEET-SUGAR INDUSTRY.

Mr. Edward L. Cull, of Toronto, Canada, furnishes the Department a second article on the beet-sugar industry. In this he especially urges upon the attention of farmers the advantages arising from the conversion of the beets into crude sirup upon the farms where raised, and, in that shape, transporting to the refiner, rather than the beets themselves in bulk. With the view of facilitating the process, and of bringing it within easy reach as to cost of appliances, he suggests and describes certain desirable machinery. The considerable attention being paid in some parts of the country to the subject of sugar-beet production will continue to excite still further discussion concerning the cheapest and more available methods of cultivation and conversion into commercial sugars and sirups. Mr. Cull writes:

Allow me to suggest to the Department that the best possible method of helping forward the manufacture of beet-root sugar would be the establishment at the various schools of agriculture and of technology in the country of a rough-and-ready set of utensils such as a farmer on a large scale, or the small manufacturer, is accustomed to use. If the sirup is made in accordance with the instructions concerning the use of such utensils, which I have already given in a pamphlet entitled "The Whole History and Mystery of Beet-Root Sugar," it will be fitted for the operations of the refiner, and will, under his treatment, yield without difficulty the maximum of sugar, as also of potash and other salines, all of which are equal in value to the sugar, at least, weight for weight. Sirup can be prepared on farms and in their immediate neighborhoods to much greater advantage by the farmer or the small manufacturer than by proprietors of large refining-works, the latter requiring, to do business on a profitable scale, the products of a far larger amount of roots than can be grown within hauling distance of the refinery. The refiner must carry on his business from one year's end to another—perhaps night and day; and by so doing will refine many hundred tons of sugar in the course of a year. His business is quite complicated enough without including the growth and reduction of the roots, the feeding of cattle, and the production of the general crops, which are required on all land devoted to the raising of one principal crop, inasmuch as all land, however good, requires the amelioration afforded by extra tillage and the careful application of the elements which go to the support of cereals. Even if the refinery is fully supplied with the rough beet-sirup, it must embrace several distinct branches of manufacturing: first, the production of refined sugar; secondly, the production of alcohol from the molasses produced, which is too full of saline particles and other impurities to be profitably used without this elimination; thirdly, the production of salines, such as potash and soda, from the wash, after it has given up its alcohol by the processes of fermentation and distillation. These three processes convert the rough sirup into three separate and distinct articles of great commercial value, and are quite sufficient to engage the attention of the capitalist. On the other hand, the farmer produces the root as one of his ordinary crops, excellent in carrying out a system of rotation. Conversion by himself of the roots into rough sirup would afford him occupation during the winter, and supply a most valuable auxiliary food for his cattle during the time he is fattening them, as well as a highly nutritive aliment for his milch-cows and young cattle and sheep. If he can produce more of this food than required for these purposes, he stores his cakes of pulp for summer use to help his stock over the droughts of summer and the failure of the pasturage with which our American climate is so often afflicted. The leaves of the beet not only afford him a valuable food for his cattle during the time he is storing his roots, but also an excellent coat of manure for the succeeding crop. The farmer need not be over particular about getting the last drop of juice from his roots—it is this which requires powerful machinery; if *he* does not get the last drops his *cattle* do, and there is no waste; whereas, in the hands of the great manufacturer who grows his own roots, the whole of the juice must be extracted, even that remaining in the pulp being washed out with water; otherwise the loss becomes ruinous.

The farmer would grow more roots than he now does if he could get an immediate and profitable return for them; but, as now too often situated, few only can command sufficient capital to procure the necessary cattle for the food at hand. Could farmers feel sure that the sugar-beets they might grow would not only provide a means of feeding their cattle, but also produce in sirup from $45 to $65 to the acre of roots produced, they would very soon put a different face on their farms, and the increased returns, including the manure increment, would enhance the fertility of the land, and

produce the effects witnessed in all beet-growing countries, that "wherever beets are grown for a sugar-crop there the produce of the land is more than doubled" not only in money-value from the sugar-crop, but also from the quantity of wheat and other grains, and of meat, which also is doubled. This has also been especially shown in France, in the Departement du Nord, where the amounts of cereals and meat have been more than double since the beet-root sugar industry became established.

How can this end be accomplished? All that the farmer will require in addition to his ordinary utensils is as follows: 1. A common wooden cage, such as any carpenter can make, to revolve in a trough, for washing the roots; 2. A rasp to be moved either by steam or horse-power, for reducing the roots to a pulp; 3. A common press, made with either screws or levers—a cider or cheese-press will answer; 4. Cloths of hemp canvas in which to envelop the pulp for pressing; 5. A boiler made of iron and wood, similar to those used in the West for boiling the juices of the maple, and of sorghum; 6. A simple filter for filtration of the juices after defecation; 7. A machine for carbonizing the lime in the juice; this is a very simple affair and not costly; 8. The evaporating-boiler—the same as mentioned in No. 5, above.

With these requisites, all that has to be done by the farmer is to evaporate the defecated and clear juice down to proper consistency. It may then be run into casks, and will keep any length of time, and can be as easily carried to market as sacks of grain, a barrel of black salts, or a barrel of pork.

FACTS FROM VARIOUS SOURCES.

EXPERIMENTS WITH WHEAT ON THE EASTERN FARM OF PENNSYLVANIA AGRICULTURAL COLLEGE.—The superintendent of the eastern experimental farm of Pennsylvania Agricultural College, located in the county of Chester, makes the following report of experiments with wheat of several varieties during the season of 1872–'73:

The ground used was an oat-stubble, with a coat of barn-yard manure plowed under and surface application of dissolved-bone and ashes compost, put on at the rate of four hundred pounds of dissolved bone and eight bushels of tan-ashes per acre, harrowed in.

The seed was sown broadcast, at the rate of two bushels per acre, on the 20th of September, 1872, and the wheat cut from July 9th to 14th, and thrashed July 15th to 20th.

The wheat was weighed when run through the fan once, and not entirely clean, but as the rakings of the plots were not included in the weights the results would not be seriously altered by the second cleaning. The plots contained one-eighth of an acre, with a space of two feet between them.

No.	Kind.	Color of grain.	Smooth or Bearded.	When ripe.	Pounds of straw.	Pounds of grain.
1	Lancaster Red	Red	Bearded	July 10	370	230
2	Rough and Ready	Red	Both	10	521	271
3	Brittany	Red	Bearded	10	300	220
4	Boger's	Amber	Smooth	14	485	261
5	Week's White	White	Bearded	9	347½	216¾
6	Tonzelle	White	Bearded	14	442	213
7	Fultz	Red	Smooth	9	503½	282½
8	Jenning's	White	Bearded	9	454½	223½
9	Shoemaker	Red	Smooth	12	461¾	228¼
10	Tappahannock	White	Smooth	9	276½	147½
11	Arnold's No. 9	White	Smooth	10	441½	204¼
12	Kansas	Red	Bearded	11	399¾	220¼
13	Dot or Paducah	Red	Bearded	9	437	226¾
14	Lancaster Early	Red	Bearded	11	426	240
15	Way	Red	Bearded	11	430	260
16	Old White C. M	Red	Bearded	11	400	225

EXPERIMENTS WITH FERTILIZERS ON WHEAT.—These experiments were made upon wheat-stubble ground, upon which barnyard manure had been used for previous crop. The fertilizers were applied at the rate of $12.50 worth per acre; put on the surface, and harrowed in on the 14th of September. On the 18th of September one and one-half bushels per acre of Fultz wheat was drilled in. Plots contained one-eighth of an acre, with two-feet of space between the rows.

	Pounds of straw per $\frac{1}{8}$ acre.	Pounds of grain per $\frac{1}{8}$ acre.
1. Bone and ashes compost*	345½	228½
2. Dissolved South Carolina rock†	398¼	257¼
3. Kainit or German potash salts	337	223
4. Professor Ville's wheat-food‡	421	251
5. Nothing	320	190
6. Ground bone on surface	353¾	222¼
7. Ground bone, one-half on the surface and one-half drilled in with the wheat	400	238
8. Ground bone, all drilled in with the wheat	448	252

* The bone and ashes compost was made of one ton of ground raw bone, 340 pounds of sulphuric acid, and 50 bushels of unleached tan-ashes.

† The South Carolina rock was treated with 700 pounds of sulphuric acid to one ton of rock, and cost $30 per ton.

‡ Ville's "wheat-food" was made as follows for one-eighth of an acre: 20 pounds pure bone phosphate, 10 pounds saltpeter, 12½ pounds of sulphate of ammonia, 15 pounds of calcined plaster.

The dissolved South Carolina rock spoken of above also did better on grass this season than any other of twenty fertilizers used.

Experiments in manner of seeding wheat.—These experiments were made on plots containing one-sixteenth of an acre, all treated alike and put in September 18, except plot No. 1. The drilling was done with Brickford and Huffman's drill.

	Pounds of straw.	Pounds of grain per $\frac{1}{16}$ acre.
1. Drilled 2½ inches deep, September 28	106¾	62¼
2. Broadcast and harrowed in September 18	150	90½
3. Drilled in 2½ inches deep, September 18	130½	88⅓
4. Drilled ½ inch deep, covered with roller, September 18	127¾	77¼
5. Drilled 4 inches deep, September 18	118	71
6. Drilled 1 bushel per acre, September 18	124	75¼
7. Drilled 2 bushels per acre, September 18	131⅓	87½

From the experiments of the past two seasons I would suggest to farmers to try the Fultz wheat, just enough to show its suitability to their soil and circumstances. With us it has proved a hardy, stiff-strawed, early, and productive wheat; grain small but reasonably plump. The Rogers is also a fine wheat, not so productive or early as the Fultz, but a better quality of wheat, and would probably do finely on strong ground, or with high manuring.

The action of different fertilizers is too uncertain to warrant the recommendation of any particular one, though the general result of their use with us has been favorable.

From our experience with fertilizers on various crops this season we have decided to use principally the following preparation, giving the quantity for one acre:

225 pounds dissolved South Carolina rock, at 1½ cents per pound	$3.37½
44 pounds sulphate of ammonia, at 6¾ cents per pound	2.97
88 pounds muriate of potash, at 3 cents per pound	2.64
Cost per acre	8.98½

These should furnish the three most valuable ingredients in all fertilizers, the phosphate, ammonia, and potash. This we propose to apply in addition to a light coat of yard-manure, plowing both down as soon as possible, and drilling in the wheat about the middle of September.

GARDENING IN SAN DOMINGO.—Dr. R. F. Dennis, writing from Puerto Plata, San Domingo, under date of the 18th of August, furnishes the following interesting account of his experiments in the cultivation of a variety of garden-seeds which were forwarded to him during the last year from this Department:

Rich in fruits and food products, the tropics seem very deficient in number and variety of garden-vegetables, as compared with the temperate regions. Sweet potatoes, yams, manioc, beans, egg-plant, tomatoes, okra, squashes, and peppers are the principal. Of the sweet potato one soon becomes tired, and neither it, nor the yam, nor the manioc, is any substitute for the Irish potato. The native tomatoes and egg-plant, although vigorous and productive, are far inferior in size and quality to the improved varieties of northern gardens. The squashes also are small, unproductive, and poor in quality. Hence our desire to introduce and test a number of new vegetables and new varieties.

With a true tropical climate—latitude about 20° north, within a mile and a half of the sea, and only a small elevation above it—and a good soil, of a clay loam, very rich in vegetable matter, on a subsoil of coraline clay, we had a good prospect the past year of making a fine trial of many seeds and plants, but, unfortunately, the season was unfavorable, there not being sufficient rain. The usual rainy season here being November, December, and January, there are properly two seasons of planting, and only two: one in the fall, at the beginning of the rains, for some few things; the other, and the best for most, in the early spring or first part of February.

The first trouble of the gardener here is in the preservation of seeds. One difficulty being the great heat and moisture of this climate; the air being always very damp, even in this drought of two years, it being difficult to dry anything except at midday; and, second, the weevil, which is very numerous and destructive. Fresh seeds from the North, in good paper packages, pasted tightly, will, with care, keep a few months, but spoil quickly after being opened. The natives here have two ways for the preservation of their own seeds. First, after drying them well in the midday sun, shutting them up in tight vessels, putting corn in demijohns, and small seeds in bottles, with some fresh, dry wood-ashes mixed with them. Our own experience with these bottled seeds is not very favorable. The second way is, after gathering one crop, to immediately replant and have some always growing, and thus "save the seed." This is not possible with everything; and even when successful is very objectionable, for planting out of season quickly causes degeneracy. And so we find all through this country; everything that can degenerate has done so; and everything that can mix has done so; no care being taken to plant any varieties separate. No budding nor grafting being practiced, but all fruits planted from the seed, the same thing has happened with them, and poor varieties are the rule.

Next as to planting. The earth here being one vast hot-bed, all good seeds sprout very quickly, provided they have the proper degree of moisture. But a tropical sun soon parches the surface of the ground, and thus frequently destroys the small ones, and generally such must be planted at twice the depth they are at the North. Covering them with boards, &c., a short time at first, will not generally answer here, as the ants often destroy all under such shelter. Contrary to the report of some, insects destructive to vegetation are wonderfully numerous and active. This is not strange, for, first, they have the whole year to feed and multiply; and second, the people here carry on such a continued hunting against all birds—even the mocking-bird being considered game—that none will come near a house or a cultivated field. Cut-worms, beetles, caterpillars, aphides, ants, &c., &c., of the North, all have their congeners here. Even of the curculio, there is a variety that stings nearly every guava in the country.

If plants escape all these enemies, with this rich soil, it is wonderful how the damp air of this climate, with the dews of night and a very few light showers of rain, will keep all green and growing during the long, hot summer under a torrid sun.

Our plantings were made in both fall and spring, or October to December and in February. The northern vegetables proper succeeded best in the fall planting; others, as tomatoes, egg-plant, melons, &c., in spring. Of varieties, the *early* kinds seemed to succeed much the best. Irish potatoes planted in November grew well as to top, but failed as to tubers; probably the earth itself is much too hot for their growth.

Cabbage (late varieties) was a partial success, but would not be considered to pay for cultivation in a northern garden. Turnips did well as to growth and size, but had a strong rank flavor. Beets were a decided success; both fall and spring plantings growing to a good size and being of a good quality. Radishes also were fine, both plantings, and some seed even was obtained from old ones. Asparagus, carrots, and salsify surprised us by making an apparently vigorous growth, but the roots were small. Onion seed nearly all failed to germinate, and the few growing never acquired any size. Of the parsley (although badly adulterated with grass seed) some came up and made very fine plants. New Zealand spinach flourished in the cool or wet months, but died in summer. Of the melons proper, the Persian, casaba, pine-apple, &c., were almost a total failure; from a few poor fruit, however, some seeds were saved to try another year, and again to see if, according to the theory of some, they will come true and good in the third year after a change of climate. Phiney's Early watermelon succeeded well; very productive of fruit and this of good quality, much surpassing the mixed native varieties here. Patagonian squash failed; Hubbard grew well, and

bore a large number, but did not ripen perfectly. Sugar-corn grew only two feet high and produced nothing. Several varieties of northern beans yielded only a small crop. Peas ditto. Northern egg-plant seed nearly all failed to germinate, and the few growing bore only small, poor fruit. Tomatoes (Trophy) did better, but not equal to those at the North. Peach-pits failed to sprout. Generally the change of climate seemed to produce a more diminished growth, a premature ripening, and a short crop, with smaller and more imperfect fruit or seeds. With such as were saved we intend to replant the coming season, to see if they will improve.

These trials being near the level of the sea, others, in the interior, at a higher elevation, may show better results.

PEANUT OIL-CAKE AS A FOOD FOR ANIMALS.—It has long been known that the greatest value of the ground-nut, (*Arachis hypogea*,) or peanut, as it is familiarly called, is in the oil which it contains. Analyses made in this Department have demonstrated that the nut, under favorable circumstances of cultivation, will yield at least 16 per cent. of oil; and it has been found that for alimentary, mechanical, and illuminating purposes, the oil is scarcely inferior to that of the almond, the olive, or the linseed. The amount of oil varies according to latitude. The nut is grown in almost all the warm climates of the world, and especially in Algeria, where it is indigenous, and where the plant appears to thrive more vigorously than elsewhere, and to afford much more oil. While in Virginia, for instance, the average yield of oil is 16 per cent., the Algerian growth is said to afford 25 to 27 per cent. It has been shown by experience in this country, in different sections of which the nut has been cultivated, that under judicious management it will produce from 50 to 75 bushels to the acre. But although it is susceptible of easy and cheap cultivation, and is grown in this country in very large quantities, the chief value of the production is almost entirely overlooked, and the crop is monopolized by the fruit-stands at the corners of our city streets. In the East Indies, and in the south of France and the countries of Mediterranean Europe and Africa, the nut is grown almost exclusively for the sake of the oil; the seed is pressed to obtain the oil, and the pressed cake, or marc, is used as a food for cattle, and in some instances is exported to Great Britain to be employed as a manure.

A series of experiments in feeding cattle with peanut oil-cake has recently been made upon the government experimental farm in Madras, British India. The official report of these experiments is both interesting and instructive. The experiments were peculiarly satisfactory in respect to draught cattle, which were found to thrive much better upon the peanut oil-cake than upon the ordinary food, and at a reduction of one-half in the cost of feeding. The cake is steeped before being fed to the cattle, and four pounds per head are allowed daily.

The following analysis of the peanut oil-cake will show its properties:

	Per cent.
Moisture	10.80
Oil	8.12
*Albuminous or flesh-forming compounds	28.62
Mucilage, gum, &c.	18.86
Cellular fiber	29.09
†Ash	4.51
Total	100.00

For the sake of comparison the following analysis of the linseed oil-cake is given:

*Containing nitrogen, 4.50. †Containing sand, 1.40.

	Per cent.
Moisture	10.67
Oil	12.87
*Albuminous or flesh-forming compounds	28.12
Mucilage, gum, &c	27.01
Cellular fiber	14.11
†Ash	7.22
Total	100.00

It will thus be seen that the peanut oil-cake is very little inferior to the linseed oil-cake, the cost of which is five-fold that of the peanut. As a food for horses the peanut oil-cake was found by these experiments extremely valuable, the feeding during two years being attended with the most gratifying results. Experiments were also made to ascertain the relative values of peanut oil-cake and Indian corn as foods for fattening pigs, and to ascertain the cost of producing a pound of pork. Four pigs of equal age and size were selected for an experiment, two being fed upon 4 pounds of peanut oil-cake daily in addition to the ordinary food, and two upon 4 pounds of corn instead of the oil-cake. In eight weeks the former had increased in weight 99 pounds and the latter 89 pounds; from which it appeared that the peanut oil-cake is more valuable than Indian corn for producing pork. The cost of the corn was about double that of the oil-cake; that is to say, the corn averaged about one cent a pound, and the oil-cake half a cent.

EXPERIMENTS IN FRUIT-CULTURE IN NORTH CAROLINA.—Mr. J. L. Labiaux, of Ridgeway, North Carolina, writes to the Department as follows, concerning the culture of the French grape and other fruits in that State:

> My enterprise, viz, the introduction of the French grape here for table use, and principally for wine-making, is a success, as I had good reason to anticipate. We planted last April and May 70,000 cuttings, a few of which are already bearing perfect bunches of fruit, (which, however, I do not think will attain perfect maturity.) This proves that in this climate and soil French plants and French experience in vine-culture well agree. Next winter and spring we intend planting 100,000 or 125,000 additional cuttings.

Permanent success, however desirable, is scarcely to be expected on the Atlantic slope in vineyard-culture of foreign grapes. It has been sought for more than a century, without anything more than a very short-lived success. Climatic conditions render it impossible, in ordinary open-air culture of the principal European varieties. It would be important to know that a single variety, with any mode of treatment, had yielded abundant fruit even for a few successive years.

In regard to other experiments being made, Mr. Labiaux says that an attempt to cultivate madder, from very doubtful seed, however, met with no success. Almond, fig, and olive plants—the latter cuttings, the first and second three-year trees—are doing very well.

KEEPING GREEN CORN.—The following inexpensive mode of preserving corn for table use after its season has passed is suggested by an experimenter: Dip the ears into boiling water and let them remain about two minutes; take them out, and when cool cut the corn from the cob and dry it, just as you would dry fruit, and when dry put it away in clean paper-sacks. By this means one may enjoy the luxury of green corn at any time.

HUMUS AND FERTILIZERS.—The Southern Cultivator publishes a communication calling the attention of planters who have used commer-

*Containing nitrogen, 4.30. †Containing sand, 1.18.

cial fertilizers to the condition of their crops, with especial reference to any difference observable in the size and growth of the cotton-plant in the same field, manured, cultivated, and in all respects treated alike, or on land which, to superficial observation, appears to be the same in different fields. It is desirable to know why the same amount of fertilizing produces a much better effect on one field than on another, both seeming, to casual observation, to be the same in quality. Giving his own experience in the matter, the writer says:

I rented to a freedman an old field which has not been cultivated in fifteen years. It was utterly exhausted before it was turned out, and was as poor as it could be. It grew broomsedge until the pines sprang up, and then the grass and pines grew together. My cattle ran on it. The freedman cut down the pines, plowed the land twice with a scooter, and with a small plow made what he called beds, and in shallow furrows, made with a scooter, scattered about 150 pounds fertilizer to the acre, and upon it dropped his cotton-seed, and covered with a board. On an adjacent field of the same quality of land originally, but which had been kept in cultivation, and more or less manured every year, I planted cotton, plowing deep with a two-horse Dodge plow, and applied 200 pounds of ammoniated phosphate, with ten bushels rotten cotton-seed to the acre, and cultivated well. The freedman's cotton is better than mine. Why? Because his ground had vegetable matter derived from the broomsedge and fine straw, of which my field had been deprived by continued cultivation. I conclude, therefore, that fertilizers put on land, no matter how liberally, without a due supply of humus, that is, vegetable matter, is thrown away. And the complaints we often hear of the worthlessness of the fertilizer is due to this cause.

As further illustrating the opinions obtaining in the South on this subject, the result of experiments made under the direction of the Hancock, Georgia, Agricultural Club may be referred to. The object was to contrast the effects of commercial and home manures. Two home composts were used, one in which 500 pounds of concentrated soluble phosphate was composted with 1,300 pounds of stable manure, and 200 pounds of ashes added just before using; a second, 1,400 pounds stable manure, 300 pounds superphosphate, 200 pound green cotton seed, 60 pounds sulphate of ammonia, and 40 pounds nitrate of soda. The commercial fertilizers employed in the experiments were five in number, of those more commonly used in the South. The following results were reported from experiments made with cotton:

Name.	Pounds to acre.	Cost per acre.	Yield per acre of seed-cotton.
			Pounds.
Logan (home) commercial	230	$1.38	675
Home commercial	200	2.00	720
Nothing	200	0.00	490
A. A. Ober	0	7.00	600
Ober's superphosphate	200	6.00	675
Pendleton	200	6.60	705
Zell	200	5.75	645
Atlantic phosphates	200	5.35	645
Five commercial mixed	200	6.35	735

The experiments during two years obviously pointed to the fact that manures having carbonaceous matter in the form of humus act better upon the soils destitute of vegetable matter, such as are a large proportion of southern soils, reduced by repeated cropping in corn and cotton, both of which tend to humus destruction. The commercial manure acts chemically upon the soil which has little but mineral elements left, and the result is often, especially in dry seasons, disastrous to crops. But home composts act both chemically and mechanically. The conductors of the experiments draw a lesson from them, that they plainly show the necessity of either a rational rotation of crops, including small grains and rest, or a resort to turning under green crops, such as peas and clover.

FARMERS' DAUGHTERS AND POULTRY-RAISING.—The following statement of profitable poultry-raising by a Delaware farmer's daughter is reported:

In Concord, a farmer's daughter, during the past year, had the care of his poultry-yard. In the spring she commenced with about 60 fowls, of the common breeds, including one Dominique rooster and several hens of that stock. She also had two roosters of the Partridge-Cochin breed. From these she raised 350 chickens. When young she fed on cracked corn, but when fattening them, gave whole corn and Indian meal. During the season she sold eggs to the amount of $90, and from September 20 to January 17, she got ready for market 150 pairs of chickens, which she sold for $260. She thinks the Dominique much the best for market, but they are not hardy when young. She has some hens of the Partridge-Cochin breed which weigh 6, 7, and 8 pounds each. It will be seen from this statement what may be done by proper attention to poultry, the profits being perhaps larger than any branch of farming. It also shows that the business is one in which females may engage with success. The time occupied in caring for 60 to 100 hens doesn't average more than an hour or two a day. The exercise is light and pleasant, and the change from household duties rather agreeable than otherwise. Indeed, we consider the poultry business, as an occupation, both profitable and interesting. Gathering eggs, setting the hens, watching the hatching, and tending to the young, have a charm, which, in connection with the profit, is calculated to please every lover of nature's great working world.

FULTZ WHEAT.—In Yates County, New York, a careful experiment was made by a correspondent of the Department with Fultz and Treadwell wheats, with reference to testing their respective merits. During the summer of 1872, an eight-acre field of gravelly loam, which had been cultivated the previous year in fodder-corn, was summer-fallowed. The field was manured in 1871 and 1872, in the latter year the manure plowed under at first plowing. Upon a plot of one-eighth of an acre of this ground, five quarts of Fultz were sown broadcast, September 10, 1872. Treadwell was drilled upon the remaining part of the field, September 18, at the rate of two bushels per acre. The former was harvested July 7, and yielded four and a quarter bushels, or thirty-fold upon its seed; the latter was harvested July 25, and yielded twenty bushels per acre, or tenfold upon its seed.

HOG-DISEASE.—A correspondent in Jefferson County, West Virginia, says:

A disease among the hogs is prevailing in the county. It is called "cholera," as that is the name given generally to all diseases to which hog-flesh is heir. A very large number have fallen victims within a few days. As yet, no effectual remedy has been found. Some of the hogs are affected with a stiffness of the jaws and loss of appetite. The first is not usual in cases of cholera, I think. I have seen some hogs quite sick with cholera eat very greedily, and others, apparently with a similar affection, entirely refuse food.

DRILLING WHEAT.—A farmer of Scott County, Illinois, urges the practice of early planting with the drill, if wheat is to be made a profitable crop in that section. Where this is done from twenty to thirty bushels per acre are raised; whereas late and broadcast sowing usually yields a return of from four to eight bushels per acre, and not of the best quality at that.

CLUB-FOOT IN CABBAGE.—A farmer of Cambria County, Pennsylvania, suggests, concerning the remedy of "club-foot" in cabbage, the following:

I mention the circumstance of a German market-gardener, who, in putting out his cabbage, followed the German custom of "puddling" the roots of a part of his plants in a thin mixture of cow-manure and water. Five rows thus treated entirely escaped disease, and are, at this writing, growing prosperously, while the remaining portion of the crop, 1,400 plants, is all dead.

IMPROVIDENT CREDIT SYSTEM IN THE SOUTH.—A Georgia correspondent states that the farmers in his section will find it impossible to

pay for the provisions and fertilizers purchased last spring, for which, in many cases, the crop was mortgaged. This system still embarrasses cotton production in several of the cotton States.

PERPETUATING VARIETIES OF SEED.—The Bledsoe County, Tennessee, Farmers' and Mechanical Association has adopted the very judicious plan of requiring every member who has received seeds for experimental purposes, (those transmitted by this Department,) to return at least as much to the society as the quantity received, if the experiment turns out favorably. In addition to the convenience of having the seeds of valuable varieties on hand for seasonable distribution, the advantages of gradually acclimatizing seeds are gained. As opposed to this provident method, a Virginia correspondent cites the fact, that in his neighborhood many persons are always anxious to get *choice* varieties of seeds when first introduced, with grave promise of submitting them to the fairest tests; but, the novelty having worn off, or indifference to the objects of the distribution supervening, nothing more is heard of them, unless, perhaps, in some cases where the farmer, not having been diligent and conscientious in cultivating the seeds, meets failure, and denounces what he has received as worthless. In this connection a printed circular of the Department touching the subject may be quoted, for the information of a large class who apply for seeds:

The object of the Department is to distribute seeds as widely as possible; and, if they prove valuable, it is expected that their product will be saved and distributed to others by the first recipient. It is impossible, therefore, to supply many persons in the same vicinity, nor will those who do not save the seed, as above suggested, be entitled to further supplies.

GLUTEN GRANULES.—Mr. Nahum E. Ballou, secretary of the Union Agricultural Institute, at Sandwich, Illinois, furnishes the Department with the following notice of a discovery by which an element of wheat, hitherto cast away in the bran, has been rendered available for a very useful purpose. The discoverer, who is a Frenchman, and a resident of Minneapolis, Minnesota, gives to the product in question the name of gluten granules. Mr. Ballou says:

The gluten granule has been found, upon experiment, to be the most valuable product of wheat, because most nutritious. Mr. Janen, the discoverer, and others associated with him, have already secured patents of machinery whereby this element may be successfully separated from the offal of the mill, which has hitherto been considered of little value. The product is most abundant in hard and flinty varieties of wheat, which, when ground by a process known among millers as high grinding, takes only from the wheat the very best quality of flour; then the process of separating the gluten granules is conducted by means of separators devised to receive the offal, and eliminate the most valuable portion of the wheat, which is in the form of minute granules. These granules are then ground into fine flour, and prove to be more valuable for bread than the flour originally taken out; for the reason, undoubtedly, that nitrogen exists largely in this portion, constituting the glutinous element. It is, in fact, this separated element that gives toughness and tenacity to flour, which exists more abundantly in some than in other brands, rendering it at once available in cookery for viscid pastes, macaroni, and vermicelli. It is the very element for supplying the waste of the tissues of our bodies, and hence this product is now being eagerly sought for on account of its valuable properties. Probably it has also a tinge of the phosphates, said to be incorporated largely with the bran. Bread made from this new element is decidedly more nutritious than bread made from the common flour, while it is moister, and, withal, pleasanter to the taste. The writer of this has occasionally seen hints during many years that the most valuable portion of the separated elements of wheat was diverted from its legitimate use. As an evidence that these ideas or hints were not without foundation, we instance that bran fed freely to a milch-cow not only improves the quality, but the quantity of milk also. This lately-ascertained property, valuable as an element of food, and hitherto considered of little value, is likely to assume a prominent place in the world's exchange as an article of commercial value; nor will millers fail to secure an additional profit in the manufacture of flour by attention to it.

FOOT-AND-MOUTH DISEASE.—The United States consul at Kingston, Jamaica, Thomas H. Pearne, transmits to the Department the following article on this disease:

It appears that in England and its West India dependencies the foot-and-mouth disease is increasing in extent and virulence. This vesicular disease must run its course, and it is therefore not desirable to resort to violent remedies, which may arrest it in its several stages toward a termination. Slight attacks of infectious diseases will require no artificial aid; but where the action of the poison in its attempts to escape makes a severe call upon the strength of the animal, the failing powers must be supported while the elimination of the virus goes on. But there must be no unnecessary addition of stimulants, which are not safe except in the last stage of prostration. From the first, there must be pure air and water, and nutriment easily assimilable. Protection from the weather must be looked to. If the temperature is moderate, the animals need not be taken from pasture, except those badly affected in the feet; to these much exercise is hurtful. Water may be given freely. So long as the animals can crop the grass, or eat hay and roots, no care is necessary; but when the appetite fails on account of soreness of the mouth, considerable care is required. Good nursing is now necessary. Pulped roots should be placed in reach of the animal, and, at times, a little hay may be gently placed in the mouth. Gruel and linseed-tea are only to be used when solid food is persistently refused, and in giving these a horn or bottle should be used, but with great care, to avoid hurting the tender mouth. The mouth may be washed with a lotion of chlorate of potash, made by dissolving one drachm of the salt in a pint of water; the feet may be syringed with a solution of common niter, made by dissolving an ounce of niter in half a gallon of water. At the same time, all the animals of the herd may be placed under the antiseptic influence of hyposulphite of soda, or carbolic acid. The hyposulphite may be given in the drink-water, about one-half ounce to a gallon of water. Each animal should have about two ounces of the hyposulphite per diem. The atmosphere of the inclosures may be charged with carbolic acid in the form of vapor. In case of acute fever, indicated by high temperature, hot and dry muzzle and horns, with redness of the visible mucous membrane and constipation, saline laxatives may be carefully administered. The dose should not exceed eight ounces of sulphite of soda or magnesia, and if it is thought necessary to repeat it, not more than half the quantity should be given. Ulceration of the secreting membrane of the feet will require the application of caustic, or undiluted carbolic acid. Afterward use a dressing of tar, and a bandage, to prevent movement of the loosened horn, otherwise complete separation may take place, crippling the animal for weeks or ending in fatal exhaustion. As a safeguard against infection, there should be isolation as complete as possible. Persons in charge of herds should not visit neighboring farms. No curious investigators should be permitted to examine the animals; dogs must be banished. Fat stock should promptly be sent to butcher or market. Neither butchers nor drovers will be allowed on the farm. Next to isolation in importance is disinfection. To some extent this may be done by the use of carbolic acid, or chloride of zinc, or sulphurous acid; the first is the most manageable and least dangerous. Sprinkle the floor of the cow-shed with the acid, or mix one part of carbolic acid with forty or fifty parts of water, and with this saturate a quantity of sawdust and scatter it on the floor. Dip cloths in the solution and hang near the doors and windows. Quicklime may be spread at the entrance, to meet the possible danger from any one entering after treading on the manure of infected animals. The following recommendations are made:

The mouth to be scoured out with strong salt and water, (brine,) then washed out several times a day with carbolic acid and water in proportion of one pint to sixty, (one to forty too strong,) and when tongue and inside of lips are stripped of skin, use a mixture of borax and honey. As the animals at this stage will be unable to feed, they must have corn-meal and molasses, given either in balls or as a drench.

When bladders appear on tongue, lance from end to end. *Wash:* One-eighth of a pound of alum, one-eighth of a pound of niter, one quart molasses, three quarts soft water. *Ointment* to be applied to gland, throat, chest, and mid-flank: Hog's lard, (fresh,) one pound; olive oil, half pound; camphor, quarter of a pound; oil of turpentine, half ounce. The animal to have cooling medicines. No corn to be allowed, neither is the animal to be cleaned when disease prevails. Soft food to be provided.

GREAT SHORT-HORN CATTLE SALE.

The herd of Hon. Samuel Campbell, of New York Mills, New York, was sold on the 10th of the present month to distinguished breeders of America and Great Britain, who contested the possession of the famous Duchesses so warmly as to push prices to an unprecedented height. A marked degree of interest was manifested in this sale throughout England, from its first announcement.

The following list, published in the Country Gentleman, (except an omission of a calf of Lady Bates 4th, which is added) and vouched for as correct by the proprietor in a letter to this office, is placed on record as a notable matter of history for future reference:

COWS.

DUCHESSES.

1st Duchess of Oneida, red and white; calved January 24, 1870; by 10th Duke of Thorndale, (28458,) dam 8th Duchess of Geneva, Lord Skelmersdale, England $30,600

7th Duchess of Oneida, red and white; calved August 3, 1872; by 2d Duke of Oneida, (9926,) dam 1st Duchess of Oneida, A. J. Alexander, Kentucky.... 19,000

10th Duchess of Geneva, roan; calved May 15, 1867; by 2d Duke of Geneva, (23752,) dam 5th Duchess of Geneva, H. W. B. Berwick, Scotland, agent for Lord Bective 35,000

8th Duchess of Oneida, roan; calved November 18, 1872; by 4th Duke of Geneva, (7931,) dam 10th Duchess of Geneva, Mr. Berwick, for Lord Bective. 15,300

13th Duchess of Thorndale, red; calved February 25, 1867; by 10th Duke of Thorndale, (28458,) dam 10th Duchess of Thorndale, Hon. A. B. Conger, Waldberg, Haverstraw, New York 15,000

4th Duchess of Oneida, red; calved January 17, 1872; by 4th Duke of Geneva, (7931,) dam 13th Duchess of Thorndale, E. G. Bedford and T. J. Megibben, Kentucky 25,000

8th Duchess of Geneva, red and white; calved July 28, 1866; by 3d Lord Oxford, (22200,) dam 1st Duchess of Geneva, R. Pavin Davies, Gloucestershire, England 40,600

10th Duchess of Oneida, red and white; calved April 8, 1873; by 2d Duke of Oneida, (9926,) dam 8th Duchess of Geneva, A. J. Alexander, Kentucky 27,000

9th Duchess of Oneida, roan; calved March 2, 1873; by 2d Duke of Oneida, (9926,) dam 12th Duchess of Thorndale, Mr. Berwick, for Lord Bective..... 10,600

12th Duchess of Thorndale, roan; calved October 13, 1865; by 6th Duke of Thorndale, (23794,) dam 5th Duchess of Thorndale, Hon. A. B. Conger..... 5,700

3d Duchess of Oneida, roan; calved March 19, 1871; by 4th Duke of Geneva, (7931,) dam 8th Duchess of Thornton, Mr. Holford, England..... 15,600

8th Duchess of Thorndale, roan; calved September 11, 1862; by 3d Duke of Airdrie, (23717,) dam Duchess of Fordham, C. F. Wadsworth, Geneseo, New York 450

15th Duchess of Geneva, red; calved June 20, 1870; by 4th Duke of Geneva, (7931,) dam 12th Duchess of Geneva—breeding uncertain, and withdrawn by unanimous consent.

5th Duchess of Oneida died from an accident since catalogue was issued.

OXFORDS.

3d Countess of Oxford, red; calved July 3, 1871; by Baron of Oxford, (23371,) dam 2d Countess of Oxford, Hon. A. B. Conger..... 9,100

2d Countess of Oxford, red; calved December 22, 1866; by 2d Duke of Geneva, (23752,) dam Gem of Oxford, A. W. Griswold, Malvern Farms, Morrisville, Vermont 2,100

12th Maid of Oxford, rich roan; calved October 18, 1872; by 4th Duke of Geneva, (7931,) dam 2d Maid of Oxford, Colonel Lewis G. Morris, Fordham, New York..... 6,000

2d Maid of Oxford, roan; calved October 22, 1862; by Grand Duke of Oxford, (16184,) dam Oxford 20th, A. W. Griswold 6,000

3d Maid of Oxford, red and white; calved September 21, 1863; by Grand Duke of Oxford, (16184,) dam Oxford 20th, Warnock & Megibben, Kentucky $1,000

7th Lady of Oxford, red and white; calved November 2, 1863; by 6th Duke of Thorndale, (23794,) dam 2d Lady of Oxford, Hon. A. B. Cornell, Ithaca, New York 400

12th Lady of Oxford, red and white; calved December 15, 1869; by 10th Duke of Thorndale, (28458,) dam 7th Lady of Oxford, Mr. Holford, England 7,000

MISCELLANEOUS.

Lady Knightley 2d, roan; calved October 11, 1868; by 3d Duke of Geneva, (23753,) dam Dewdrop, E. K. Thomas, Kentucky 3,100

Lady Knightley 3d, roan; calved July 28, 1871; by 2d Duke of Tregunter, (26022,) dam Lady Knightley 2d, Colonel Lewis G. Morris 5,000

Lady Knightley 4th, red; calved July 30, 1872; by 4th Duke of Geneva, (7931,) dam Lady Knightley 2d, A. W. Griswold 4,000

Rosamond 7th, red roan; calved May 26, 1868; by Weehawken, (5260,) dam Rosamond, W. R. Duncan, Towanda, Illinois 700

Rosamond 5th, red; calved April 13, 1867; by 3d Duke of Geneva, (23753,) dam Rosamond 4th, Warnock & Megibben 700

Rosamond 4th, light roan; calved February 10, 1864; by Iron Duke, (4043,) dam Rosamond 2d, James Mix, Kankakee, Illinois 550

Lady Newham 4th, red; calved December 17, 1867; by Weehawken, (5260,) dam May Queen, James Mix 250

Lady Newham 5th, red; calved April 12, 1870; by Weehawken, (5260,) dam Lady Newham 2d, James Mix 450

Lady Newham 6th, red; calved September 4, 1870; by Royal Briton, (27351,) dam Lady Newham 4th, Hughes & Richardson, Lexington, Kentucky 775

Lady Newham 8th, roan; calved May 21, 1871; by Baron of Oxford, (23371,) dam Lady Newman 2d, Hon A. B. Conger 1,100

Lady Newham 10th, red; calved August 4, 1872; by 4th Duke of Geneva, (7931,) dam Lady Newham 4th, Hughes & Richardson 525

Rosamond 10th, red; calved October 13, 1871; by 4th Duke of Geneva, (7931,) dam Rosamond 4th, W. R. Duncan, Towanda, Illinois 2,050

Rosamond 12th, red; calved December 27, 1872; by 4th Duke of Geneva, (7931,) dam Rosamond 4th, A. W. Griswold 525

Lady Newham 9th, red; calved May 20, 1872; by 4th Duke of Geneva, (7931,) dam Lady Newham 2d, Hon. A. B. Cornell 400

Lady Newham 2d, red and white; calved June 25, 1861; by Belmont, (2533,) James Mix 205

Lady Newham 11th, red; calved January 22, 1873; by 2d Duke of Oneida, (9926,) Hughes, & Richardson 405

Lady Newham 12th, red; calved June 27, 1873; by 2d Duke of Oneida, (9926) Hughes & Richardson 305

Brenda, roan; calved November 27, 1870; by 4th Duke of Geneva, (7931,) Colonel L. G. Morris 2,500

Berlinda, roan; calved March 21, 1872; by 4th Duke of Geneva, Colonel L. G. Morris 2,300

Berlina, white; calved December 7, 1863; by Lord Mayor of Oxford, (4954,) Caleb Haley, New York 325

Bloom 2d, red and white; calved June 9, 1867; by 4th Lord of Oxford, (5903,) I. P. Fisher, Danville, Ky 800

Bloom 4th, red and white; calved April 14, 1872; by the 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 1,000

Bloom 5th, red and white; calved April 20, 1873; by 2d Duke of Oneida, (9926,) Cassius M. Clay, Kentucky 900

Mazurka 9th, red roan; calved May 13, 1860; by 3d Duke of Airdrie, (23717,) Colonel W. S. King, Minneapolis, Minnesota 600

Moselle, red roan; calved May 28, 1864; by Lord of the Alley, (5901,) A. W. Griswold 1,425

Moselle 6th, red; calved July 2, 1872; by 4th Duke of Geneva, (7931,) Colonel W. S. King 800

Magnolia, red; calved May 4, 1870; by 4th Duke of Geneva, (7931,) A. W. Griswold 225

Peri 5th, red and white; calved August 13, 1872; by 2d Duke of Oneida, (9926,) Colonel W. S. King 1,300

Peri 4th, red and white; calved October 26, 1869; by 10th Duke of Thorndale, (28458,) dam Penance by 2d Grand Duke, (12961,) Colonel W. S. King 1,700

Lady Bates 4th, read roan; calved October 2, 1867; by 11th Duke of Thorndale, (5611,) Edwin G. Bedford, Paris, Kentucky $3,250
Lady Bates 5th, red and white; calved February 20, 1868; by 11th Duke of Thorndale, (5611,) Geo. M. Bedford, Paris Kentucky 1,100
Lady Bates 6th, roan; calved April 15, 1872; by 4th Duke of Geneva, (7931,) Geo. M. Bedford 2,300
Lady Bates 7th, red; calved May 17, 1872; by 4th Duke of Geneva, (7931,) Hon. Alonzo B. Cornell 1,600
Lady Bates, roan; calved February 2, 1863; by Duke of Airdrie, (12730,) Chas. F. Wadsworth, Geneseo, New York 305
Calf from Lady Bates 4th, Colonel W. S. King 1,600
Wild Flower, red; calved July 28, 1862; by Clifton Duke, (3760,) B. B. Groom, Winchester, Kentucky 400
Wilda, red; calved January 6, 1873; by 4th Duke of Geneva, (7931,) Hughes & Richardson 950
Nacuna, roan; calved May 25, 1866; by 9th Duke of Thorndale, (5609,) James Mix 475
Victoria 7th, red; calved July 30, 1867; by 6th Duke of Thorndale, (23794,) A. W. Griswold 1,525
Victoria 9th, red; calved October 20, 1871; by Royal Briton, (27351,) Hon. A. B. Cornell 800
Victoria 10th, red and white; calved March 19, 1873; by 2d Duke of Oneida, (9926,) Hon. A. B. Cornell 500
Alphea, red; calved March 27, 1871; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 500
Alpha, roan; calved February 3, 1863; by Grand Turk, (12969,) Hon. Lewis F. Allen, Black Rock 300
Adalina, red and white; calved March 28, 1866; by 6th Duke of Thorndale, (23794,) Hon. A. B. Cornell 700
Arabella, red; calved October 27, 1867; by 10th Duke of Thorndale, (28458,) Hon. A. B. Cornell 425
Armentine, red; calved October 22, 1872; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 500
Araminta, red roan; calved April 7, 1868; by 10th Duke of Thorndale, (5610,) Hon. A. B. Cornell 500
Alcyone, red and white; calved April 15, 1872; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 700
Arminta, roan; calved November 21, 1871; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 425
Adeliza, red and white; calved November 14, 1870; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 400
Atlantic Gwynne, roan; calved June 10, 1870; by Grand Duke of Lightburne, (26290,) Lord Skelmersdale 2,000
Miss Gwynne, roan; calved April 11, 1873; by 2d Duke of Oneida, (9926,) Colonel W. S. King 1,700
Roan Duchess 3d, red and white; calved October 3d, 1867; by 11th Duke of Thorndale, (5611,) George M. Bedford, Paris, Kentucky 1,025
Butterfly Belle, red roan; calved September 24, 1864; by Imperial Oxford, (24185,) A. W. Griswold 875
Butterfly Beauty, red; calved October 12, 1867; by 2d Duke of Geneva, (23752,) A. W. Griswold 270
Butterfly Bland, red; calved May 9, 1872; by 4th Duke of Geneva, (7931,) Hon. A. B. Cornell 825
Baron Oxford's Beauty, roan; calved March 11, 1868; by Baron Oxford, (23375,) Bush & Hampton, Winchester, Kentucky 1,500
Heifer calf of above, by 2d Duke of Oneida, B. F. Van Meter, Winchester, Kentucky 500
Beauty's Pride, red; calved April 27, 1872; by 4th Duke of Geneva, (7931,) A. W. Griswold 1,725
May Lass 2d, red roan; calved March 25, 1868; by General Napier, (24023,) Hughes & Richardson 800
Lady Worcester 4th, rich roan; calved June 3, 1868; by 2d Duke of Wetherby, (21618,) Mr. Holford, England 3,000
Lady Worcester 5th, red; calved April 20, 1871; by 4th Duke of Geneva, (7931,) Mr. Holford 3,100
Sidonia 2d, red; calved August 6, 1868; by Didmartin Duke, (21546,) Hughes & Richardson 800
Sidonia 4th, red; calved May 11, 1873; by 4th Duke of Oneida, (11799,) Hughes & Richardson 530
Cherry Constance, roan; calved October 10, 1869; by 4th Duke of Geneva, (7931,) sold with young bull-calf, Colonel W. S. King 1,100

Cherry Constance 2d, red; calved May 6, 1872; by 11th Duke of Geneva, (9843,) T. J. Megibben, Cynthiana, Kentucky	$1,725
Empress of Acomb, rich roan; calved April 18, 1867; by Lord Blithe, (22126,) Hon. David Christie, Paris, Canada	525
White Empress, white; calved December 6, 1871; by Royal Briton, (27351,) Simon Beattie, Bangor, Canada	1,000
Fidessa, roan; calved May 23, 1867; by Duke of Gwynne, (4730,) with bull-calf just dropped, I. P. Fisher, Kentucky	555
War Trophy, red roan; calved May 31, 1868; by Cherry Prince, (23555,) B. B. Groom	250
Water Lily, red and white; calved May 12, 1868; by Breast Plate, (19337,) Bush & Hampton	1,125
Mistress Ford, roan; calved December 15, 1868; by Lord Lyons, (26677,) Simon Beattie	500
Lady Valentine 3d, roan; calved January 1, 1871; by 4th Duke of Geneva, (7931,) James Miles, Pennsylvania	525
Rose of Summer, red; calved April 6, 1872; by Knight of St. George, (26544,) out of health and withdrawn	

BULLS.

1. 2d Duke of Oneida, red; calved August 3, 1870; T. J. Megibben, Cynthiana, Kentucky	$12,000
2. 4th Duke of Oneida, red and white; calved January 16, 1872; (sold under guarantee that "he has been, is now, and will be a getter,") Hon. A. B. Cornell	7,600
3. Alderman, calved 1871, Hon. A. B. Cornell	250
4. Advance, 1871, James Mix, Illinois	180
5. Wild Oats, W. R. Duncan, Illinois	160
6. 7th Duke of Oneida, A. W. Griswold	4,000
7. Waterman, B. P. Goff, Clark County, Kentucky	325
8. Fidalgo, W. R. Duncan	275
9. Mill Boy, Mr. Palmer, Virginia	300
10. Prince Alfred, Thomas Dun, London, Ohio	600
11. 10th Earl of Oxford, Hon. A. B. Cornell	2,500
12. Roderigo, C. M. Lansing, Attica, New York	200
13. 6th Lord Oxford, Simon Beattie	1,300
14. Rufus, Professor M. Miles, Lansing, Michigan	350
15. Baron Bates 5th, Hon. A. B. Cornell	525
16. Bright Butterfly, Hon. A. B. Cornell	200
17. Bull calf of Lady Worcester 4th, Simon Beattie	450

[Of the above bulls, Nos. 5 to 11, inclusive, were yearlings, and all the later ones calves of 1873. Nos. 1, 3, 4, 6, 8, 10, and 12 were got by 4th Duke of Geneva; No. 2 by Baron of Oxford; No. 5 by Royal Duke of Oxford; No. 7 by Royal Briton, and Nos. 9, 11, 13, 14, 15, 16, and 17 by 2d Duke of Oneida.

SUMMARY.

11 Duchesses, averaging $21,709 each	$238,800
7 Oxfords, averaging $4,514 each	31,600
74 other females, averaging $1,086 each	80,375
92 cows and heifers, averaging $3,813 each	350,775
17 bulls and bull calves, averaging $1,836 each	31,215
109 head, $3,504	381,990

In the above summary the 8th Duchess of Thorndale, whose age probably incapacitated her from breeding, is counted among the "other females." For the same reason six other old cows were sold, at the request of the audience, as beef-cattle.

MARKET PRICES OF FARM PRODUCTS.

AUGUST AND SEPTEMBER, 1873.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of each month.

Articles.	August.	September.
NEW YORK.		
Flour, superfine State ..... per barrel..	$4 90 to $5 25	$5 10 to $5 65
extra State ..... do	6 00 to 7 10	6 35 to 7 50
superfine western ..... do	4 90 to 5 25	5 10 to 5 65
extra to choice western ..... do	5 85 to 10 75	6 30 to 10 75
southern ship'g, com. to choice .. do	6 25 to 7 85	6 65 to 7 85
southern family, ord'y to choice .. do	7 90 to 10 75	7 85 to 10 75
Wheat, No. 1 spring ..... per bushel..	1 46 to 1 47	1 62 to 1 64
No. 2 spring ..... do	1 41 to 1 42	1 53 to 1 59
winter, red, western ..... do	1 50 to ———	1 58 to 1 68
winter, amber, western ..... do	1 57 to 1 62	1 68 to 1 73
winter, white, western ..... do	1 50 to 1 80	1 65 to 1 85
Rye ..... do	80 to ———	95 to ———
Barley ..... do	——— to ———	——— to ———
Corn ..... do	48 to 58	52 to 68
Oats ..... do	41 to 52	43 to 47¾
Hay, first quality ..... per ton...	30 00 to 34 00	24 00 to 31 00
second quality ..... do	28 00 to 30 00	20 00 to ———
Pork, mess ..... per barrel..	17 50 to ———	17 50 to 17 70
extra prime ..... do	15 00 to 15 25	15 00 to 15 12½
prime mess ..... do	——— to ———	16 50 to 17 50
Lard ..... per pound..	8 9/16 to 8¾	8 7/16 to 9
Beef, plain mess ..... per barrel..	9 00 to 10 50	9 00 to 10 50
extra mess ..... do	11 25 to 12 50	11 25 to 12 50
Butter, western ..... per pound..	13 to 25	14 to 25
State dairy ..... do	25 to 33	25 to 33
Cheese, western factory ..... do	10¼ to 13¾	10 to 12½
State factory ..... do	13 to 14	12 to 13
Cotton, ordinary to good ordinary .... do	14½ to 17⅞	14 to 17⅛
low middling to good middli'g .. do	19⅝ to 22¼	19 to 22
Sugar, soft yellow ..... do	9 to 10⅝	9⅜ to 10⅛
soft white ..... do	10¼ to 10⅝	10⅝ to 11⅛
Tobacco, lugs, all grades ..... do	7 to 8½	7 to 8½
com. to med. leaf, all grades .. do	8½ to 10½	8½ to 10½
Wool, American Saxony fleece ..... do	50 to 53	50 to 53
American merino, full blood .... do	48 to 50	48 to 50
American, combing ..... do	55 to 60	55 to 60
California, spring clipped ..... do	18 to 31	18 to 31
California, fall clipped ..... do	16 to 22	16 to 22
Texas ..... do	16 to 33	16 to 33
BOSTON.		
Flour, western, superfine ..... per barrel..	4 50 to 5 50	5 00 to 5 50
western extras ..... do	6 00 to 9 00	6 25 to 9 00
western choice ..... do	9 00 to 11 00	9 00 to 10 75
southern extras ..... do	6 00 to 6 50	6 25 to 6 75
choice Baltimore ..... do	9 00 to 11 00	9 00 to 11 00
Wheat ..... per bushel..	1 45 to 1 80	1 45 to 1 80
Rye ..... do	80 to 85	95 to ———
Barley ..... do	90 to 1 20	——— to ———
Oats ..... do	43 to 55	43 to 57
Corn, southern yellow ..... do	64 to 66	71 to 72
western yellow ..... do	64 to 66	71 to 72
Hay, eastern and northern ..... per ton..	18 00 to 30 00	18 00 to 30 00

Market prices of farm products—Continued.

Articles.	August.	September.
BOSTON—Continued.		
Beef, western mess ..... per barrel..	$10 50 to $12 50	$10 50 to $12 50
western extra ..... do.....	12 50 to 13 50	12 50 to 13 50
Pork, prime ..... do.....	14 00 to 15 00	15 00 to 15 50
mess ..... do.....	17 00 to 18 00	18 00 to 18 50
Lard ..... per pound..	8¾ to 9¼	8¾ to 9½
Butter, N. Y. and Vt. fair to choice ..... do.....	23 to 28	22 to 32
western, fair to choice ..... do.....	20 to 25	18 to 26
Cheese, N. Y. and Vt. factory, choice .do.....	11½ to 13	11½ to 13½
Western factory, choice ..... do.....	12 to 12½	12½ to 13
Cotton, ordinary to good ordinary .... do.....	13 to 17½	13 to 17
low middling to middling ..... do.....	19 to 22½	18¾ to 22
Sugar, fair to good refining ..... do.....	7⅝ to 8⅛	——— to ———
Tobacco, lugs ..... do.....	7½ to 9	7½ to 9
common to medium leaf .... do.....	9 to 10½	9 to 10½
Wool, Ohio and Pennsylvania ..... do.....	43 to 55	45 to 58
Michigan ..... do.....	40 to 48	43 to 50
other western ..... do.....	40 to 48	42 to 48
pulled ..... do.....	15 to 55	15 to 55
combing-fleece ..... do.....	52 to 57	56 to 60
California ..... do.....	17 to 35	17 to 35
Texas ..... do.....	18 to 30	18 to 30
PHILADELPHIA.		
Flour, superfine ..... per barrel..	3 50 to 4 25	3 50 to 4 25
Pennsylvania extra ..... do.....	4 00 to 5 00	4 62½ to 5 25
Pennsylvania family ..... do.....	7 25 to 8 25	7 25 to 8 00
western family ..... do.....	6 50 to 8 50	7 50 to 8 25
western fancy ..... do.....	9 00 to 10 00	8 00 to 9 50
Wheat, winter, red, western ..... per bushel..	1 40 to 1 55	1 60 to 1 65
winter, amber, western ..... do.....	1 50 to 1 60	1 63 to 1 70
winter, white, western ..... do.....	1 65 to 1 85	1 70 to 1 85
spring ..... do.....	1 38 to 1 40	——— to 1 60
Rye ..... do.....	75 to 78	82 to 85
Barley malt ..... do.....	1 10 to 1 40	1 05 to 1 25
Oats, western, white ..... do.....	48 to 52	43½ to 48
western, mixed ..... do.....	41½ to ———	39 to 44
Corn, yellow ..... do.....	58 to 60	66 to ———
Hay, fresh, baled ..... per ton..	28 00 to 32 00	26 00 to 28 00
common to fair shipping ..... do.....	22 00 to 28 00	20 00 to 22 00
Pork, mess ..... per barrel..	17 50 to 17 75	17 50 to 17 75
prime mess ..... do.....	16 00 to 16 50	16 00 to 16 50
prime ..... do.....	14 50 to ———	14 50 to ———
Beef, western mess ..... do.....	8 00 to 10 00	8 00 to 10 00
extra mess ..... do.....	10 00 to 12 00	10 00 to 12 00
Warthman's city family ..... do.....	15 00 to 15 50	15 50 to ———
Lard ..... per pound..	8½ to 11½	8½ to 11½
Butter, choice ..... do.....	18 to 30	18 to 33
good ..... do.....	15 to 25	13 to 22
Cheese, New York factory ..... do.....	13 to 14	13 to 14
Ohio factory ..... do.....	12 to 12½	13 to 13½
Cotton, ordinary to good ordinary .... do.....	13¾ to 17½	14¾ to 18½
low middling to good middling. do.....	20 to 22½	18 to 23
Sugar, fair to good, refining ..... do.....	7¾ to 8¼	8⅛ to 8½
Wool, Ohio X and XX ..... do.....	48 to 50	50 to 52½
Ohio combing ..... do.....	61 to ———	65 to ———
Indiana tub ..... do.....	50 to 54	53 to 55
pulled ..... do.....	22½ to 45	——— to ———
unwashed ..... do.....	31½ to 37½	33⅓ to 42

Market prices of farm products—Continued.

Articles.	August.	September.
BALTIMORE.		
Flour, superfine.....per barrel..	$4 50 to $8 50	$5 00 to $8 25
extra.....do.....	6 00 to 8 50	6 00 to 9 00
family and fancy.....do.....	7 50 to 10 50	7 50 to 10 75
Wheat, white, fair to choice.....per bushel..	1 60 to 1 75	1 65 to 1 90
amber, choice.....do.....	1 65 to 1 66	1 80 to ———
red, common to prime.....do.....	1 45 to 1 63	1 50 to 1 78
red, western.....do.....	1 45 to 1 53	1 60 to 1 65
Rye, common to prime.....do.....	60 to 62	75 to 88
Corn, yellow, southern.....do.....	58 to 59	60 to ———
white, southern.....do.....	86 to 87	72 to ———
mixed, western.....do.....	56 to 56½	62 to 62½
Hay, western, good.....per ton...	20 00 to 25 00	20 00 to 25 00
Pork, mess.....per barrel..	17 50 to ———	18 00 to ———
Lard.....per pound..	9 to 9¾	9 to 9¾
Beef, Baltimore mess.....per barrel..	15 00 to 20 00	15 00 to 20 00
extra.....do.....	23 00 to 25 00	23 00 to 25 00
Butter, western.....per pound..	14 to 21	15 to 25
Cheese, eastern cutting.....do.....	13½ to 14	14 to 14½
western cutting.....do.....	12 to 12½	13½ to 14
Cotton, ordinary to good ordinary....do.....	14 to 16	13 to 17
low middling to middling.....do.....	19 to 20½	18 to 19¾
Sugar, New Orleans.....do.....	8 to 9½	8 to 9½
Tobacco, common to good, lugs...per cental..	6 00 to 9 50	6 00 to 9 50
common to medium, leaf....do.....	8 00 to 11 00	8 00 to 11 00
Wool, fleece-washed, com. to fine...per pound..	45 to 50	45 to 50
tub-washed.....do.....	55 to 60	55 to 60
unwashed.....do.....	35 to 38	35 to 38
pulled.....do.....	35 to 40	35 to 40
CINCINNATI.		
Flour, superfine.....per barrel..	4 85 to 5 25	4 75 to 5 50
extra.....do.....	5 85 to 6 25	6 50 to 6 85
family and fancy.....do.....	6 25 to 8 00	6 85 to 8 25
Wheat, red winter, No. 1.....per bushel..	——— to 1 30	1 46 to 1 47
red winter, No. 2.....do.....	1 20 to 1 27	1 38 to 1 45
bill.....do.....	1 25 to 1 35	1 45 to 1 50
white winter.....do.....	1 25 to 1 43	1 47 to 1 55
Rye.....do.....	68 to 70	80 to 82
Barley malt.....do.....	1 00 to 1 25	1 10 to 1 30
Corn.....do.....	40 to 52	50 to 53
Oats.....do.....	36 to 43	30 to 40
Hay, baled, No. 1.....per ton....	15 00 to ———	16 00 to 18 00
lower grades.....do.....	10 00 to 12 00	12 00 to 15 00
Beef, plate.....per barrel..	11 50 to 12 00	12 00 to 13 00
Pork, mess.....do.....	15 50 to 16 00	16 00 to 16 25
Lard.....per pound..	7⅓ to 8 ¼	7 3/10 to 8¼
Butter, choice.....do.....	20 to 22	22 to 25
prime.....do.....	16 to 18	18 to 20
Cheese, factory.....do.....	11½ to 11⅝	13⅓ to 14
pine-apple.....do.....	——— to ———	——— to ———
Cotton, ordinary to good ordinary....do.....	11¾ to 15	12½ to 15
low middling to middl'g.....do.....	18 to 20	17½ to 19½
Sugar, New Orleans, common to fair..do.....	——— to 9½	9⅝ to 10¼
good to prime.....do.....	9¾ to 10½	10½ to 11
Tobacco, lugs, all grades.....do.....	6 to 22	7 to 15
leaf.....do.....	8 to 31	9 to 31
Wool, fleece-washed, com. to fine.....do.....	35 to 40	42 to 45
tub-washed.....do.....	40 to 45	45 to 47
unwashed, clothing.....do.....	25 to 28	28 to 30
unwashed, combing.....do.....	35 to 37	35 to 37
pulled.....do.....	33 to 35	33 to 36

Market prices of farm products—Continued.

Articles.	August.	September.
CHICAGO.		
Flour, white win'r, ex., f'r to choice, per barrel	$6 75 to $9 00	$6 75 to $9 50
red winter, extras, do	5 75 to 7 00	6 50 to 7 50
good to choice spring, extras, do	6 00 to 6 50	5 75 to 6 50
spring, superfines, do	2 50 to 4 50	2 50 to 4 50
good to fancy Minnesota, do	6 00 to 7 62½	6 00 to 7 75
Wheat, No. 1 spring, per bushel	1 25 to ———	1 18¾ to 1 20
No. 2 spring, do	1 20 to 1 21	1 14 to 1 17
No. 3 spring, do	1 04½ to ———	1 10 to 1 10½
Rye, No. 2, do	55 to 56	68 to 68½
Barley, No. 2, do	70 to 81	1 12 to 1 17
Corn, No. 2, do	36⅝ to 37	40⅜ to 41
Oats, No. 2, do	26½ to 26¾	27⅜ to 28¼
Hay, timothy, per ton	13 00 to 16 50	10 00 to 15 00
prairie, do	7 00 to 11 00	8 00 to 11 00
Pork, mess, per barrel	15 55 to 15 62½	15 75 to 15 85
Beef, mess, do	8 75 to 9 00	8 75 to 9 00
extra mess, do	9 75 to 10 00	9 75 to 10 00
Lard, per cental	7 50 to 7 90	7 62½ to 7 87½
Butter, strictly choice yellow, per pound	19 to 21	22 to 25
medium to good, do	16 to 17	17 to 20
Cheese, New York factory, do	11 to 12	12½ to 13½
Ohio and western factory, do	9½ to 11	11 to 12½
Sugar, New Orleans, common to fair, do	8 to 9½	8 to 9¼
do prime to choice, do	9¾ to 10	8¾ to 9¼
Wool, tub-washed, do	40 to 48	40 to 48
fleece-washed, do	35 to 42	35 to 42
unwashed, do	25 to 26	25 to 30
pulled, do	35 to 38	35 to 38
SAINT LOUIS.		
Flour, white, superfine, per barrel	4 50 to 5 00	4 75 to 5 75
winter, extra, do	5 50 to 7 00	6 00 to 6 75
winter, choice and family, do	7 50 to 9 00	7 00 to 9 25
Wheat, red winter, No. 1, per bushel	1 48 to ———	1 45 to 1 60
red winter, No. 2, do	1 37 to 1 40	1 33 to 1 40
spring, No. 2, do	——— to ———	1 00 to 1 10
Rye, do	68 to ———	62 to 80
Barley, do	65 to ———	93 to 1 09
Corn, do	37½ to 46½	44 to 55½
Oats, do	29½ to 36	33 to 37
Hay, prime to choice timothy, per ton	14 00 to 17 00	17 50 to 19 50
Pork, mess, per barrel	16 50 to 16 62½	16 75 to 17 00
Beef, mess, do	14 00 to ———	14 00 to ———
Lard, per pound	7 to 9½	7¼ to 9¾
Butter, choice dairy, do	16 to 17	24 to 27
second-class, do	12 to 14	19 to 22
Cheese, choice factory, do	——— to ———	13 to 14
Cotton, middling, do	18½ to ———	18 to ———
Wool, tub-washed, do	42 to 48	50 to 51
unwashed, do	26 to 30	——— to ———
mixed, combing, do	32 to 35½	35 to 38
NEW ORLEANS.		
Flour, superfine, per barrel	4 25 to 4 50	——— to ———
extra, do	5 00 to 6 75	5 75 to 8 50
choice, do	7 00 to 10 00	8 75 to 9 75
Corn, white, per bushel	72 to 73	68 to 68½
mixed, do	58 to 60	65 to 67
Oats, per bushel	$0 42 to $0 43	$0 43 to $0 48
Hay, choice, per ton	25 00 to ———	27 00 to 28 00
prime, do	22 00 to ———	22 00 to 26 00
Pork, mess, per barrel	16 87½ to 17 00	17 00 to 18 50

Market prices of farm products—Continued.

Articles.	August.	September.
NEW ORLEANS—Continued.		
Beef, Texas ..... do	11 00 to ———	11 00 to ———
northwestern and western ..... do	14 00 to 15 00	14 00 to 15 00
Fulton Market ..... half barrel	10 50 to 10 75	10 25 to ———
Lard ..... per pound	8½ to 10½	8⅝ to 11¼
Butter, choice western ..... do	20 to 22	24 to 25
choice Goshen ..... do	34 to 35	——— to 35
Cheese, choice western factory ..... do	12½ to 13	13 to 14
New York cream ..... do	16 to ———	16 to ———
Cotton, ordinary to good ordinary ..... do	11½ to 17	12¼ to 16½
low middling to good middling ..... do	17⅜ to 20	17½ to 19½
Tobacco, lugs ..... do	6½ to 8½	6½ to 8½
low-leaf ..... do	9 to 10	9 to 10
medium-leaf ..... do	10½ to 11	10½ to 11
Wool, clear bale ..... do	26 to 27	25 to 26
Louisiana, clear ..... do	18 to 20	18 to 22
Sugar, fair ..... do	8¾ to 9½	9½ to 10¾
prime ..... do	10 to ———	10⅜ to 11½
yellow, clarified ..... do	10½ to ———	10⅜ to 11
SAN FRANCISCO.		
Flour, superfine ..... per barrel	4 00 to 4 75	5 00 to 5 25
extra ..... do	5 00 to 5 25	5 50 to 5 75
higher grades ..... do	5 25 to 5 75	6 25 to 6 50
Wheat, State ..... per cental	1 65 to 1 80	2 00 to 2 15
Oregon ..... do	1 65 to 1 75	2 05 to 2 10
Barley ..... do	1 10 to 1 30	1 25 to 1 40
Oats ..... do	1 65 to 1 70	1 60 to 1 75
Corn, white ..... do	1 30 to ———	1 30 to 1 35
yellow ..... do	1 25 to 1 27½	1 32½ to 1 35
Hay, State ..... per ton	——— to 15 50	12 50 to 15 50
Pork, mess ..... per barrel	18 00 to 18 50	18 00 to 18 50
prime mess ..... do	17 00 to 17 50	17 00 to 17 50
Beef, mess ..... do	11 50 to ———	10 00 to 10 50
Lard ..... per pound	10½ to 12	10½ to 12
Butter, overland ..... do	15 to 25	15 to 25
California ..... do	25 to 30	25 to 35
Oregon ..... do	15 to 18	15 to 18
Cheese ..... do	12 to 15	12 to 15
Wool, native ..... do	13 to 16	13 to 16
California ..... do	18 to 25	18 to 25
Oregon ..... do	18 to 25	24 to 27

LIVE-STOCK MARKETS.

NEW YORK.		
Cattle, extra beeves ..... per cental	$12 25 to $12 50	$12 50 to $12 75
lower grades ..... do	9 00 to 12 00	9 50 to 12 25
average ..... do	10 25 to 11 00	10 50 to 11 00
Texans ..... do	7 50 to 9 50	6 50 to 10 00
milch-cows, common to choice . per head	25 00 to 65 00	30 00 to 65 00
calves, fair to prime, milk-fed . per cental	7 00 to 8 50	10 00 to ———
common to ordinary ..... do	5 00 to 6 50	8 22 average.
Sheep, lambs ..... do	5 50 to 8 50	5 25 to 8 00
Sheep ..... do	4 00 to 6 25	4 50 to 6 50
Hogs ..... do	5 00 to 5 25	4 87½ to 5 37½

Live-stock markets—Continued.

Articles.	August.			September.		
BOSTON.						
Cattle, choice beeves.....per cental..	$7 12½	to	$7 25	$7 00	to	$7 12½
extra.....do.....	6 50	to	6 75	6 00	to	6 50
first quality.....do.....	5 62	to	6 25	5 25	to	5 75
second quality.....do.....	5 00	to	5 50	4 75	to	5 00
third quality.....do.....	4 50	to	4 75	4 00	to	4 50
working-oxen.....per pair..	100 00	to	275 00	100 00	to	250 00
milch-cows with calves.....per head..	35 00	to	60 00	35 00	to	60 00
extra.....do.....	55 00	to	75 00	65 00	to	80 00
farrow cows.....do.....	15 00	to	35 00	15 00	to	35 00
yearlings.....do.....	10 00	to	18 00	10 00	to	18 00
veal-calves.....do.....	4 00	to	12 00	4 00	to	12 00
Sheep, in lots.....do.....	3 00	to	3 75	3 00	to	4 00
extra.....do.....	4 00	to	6 00	4 50	to	5 50
spring lambs.....per cental..	6 50	to	8 50	6 00	to	7 50
Hogs, western, fat.....do.....	6 00	to	———	6 00	to	———
PHILADELPHIA.						
				———	to	———
Cattle, fair to extra choice beeves..per cental..	6 25	to	7 75	5 00	to	7 50
common.....do.....	4 50	to	5 50	3 50	to	4 50
Sheep, fair to good.....do.....	4 50	to	5 75	4 50	to	6 12½
common.....per head..	———	to	———	2 00	to	3 50
Hogs, corn-fed.....per cental..	7 50	to	7 75	6 75	to	7 25
BALTIMORE.						
Cattle, best beeves.....per cental..	5 50	to	6 87	5 25	to	6 50
first quality.....do.....	4 50	to	5 50	4 25	to	5 25
medium, or good fair quality..do.....	4 00	to	4 50	3 75	to	4 25
ordinary thin steers, oxen, or cows.....do.....	3 50	to	4 00	2 75	to	3 25
general average of market....do.....	5 12	to	———	4 50	to	———
extreme range of prices.....do.....	3 50	to	6 87½	2 75	to	6 50
Sheep, fair to good.....do.....	4 50	to	5 00	4 00	to	5 00
good to extra.....do.....	4 00	to	6 00	5 00	to	5 75
lambs.....do.....	2 00	to	4 50	2 00	to	4 00
Hogs, corn-fed.....per cental..	7 25	to	7 62½	6 25	to	6 50
CINCINNATI.						
Cattle, shipping.....per cental..	4 75	to	5 00	———	to	———
prime butchers'.....do.....	4 25	to	4 75	4 75	to	5 00
fair to good butchers'.....do.....	3 75	to	4 25	3 75	to	4 50
Sheep, common to prime.....do.....	3 00	to	4 00	3 00	to	4 75
lambs.....do.....	4 00	to	6 00	4 00	to	5 50
Hogs, common to extra.....do.....	4 60	to	5 00	4 50	to	4 75
CHICAGO.						
Cattle, extra-graded steers, 1,400 pounds and upwards.....per cental...	5 80	to	6 10	5 80	to	6 00
choice beeves, fine, fat, well-formed steers, 3 to 5 years old, 1,250 pounds and upwards.....per cental..	5 40	to	5 65	5 40	to	5 70
good beeves, well-fattened, finely formed steers, 1,150 to 1,250 pounds, per cental..	5 00	to	5 25	4 80	to	5 20
medium grade steers in fair flesh, 1,050 to 1,200 pounds...per cental..	4 60	to	4 90	4 50	to	4 75
butchers' stock, common to fair steers and good to extra cows, 800 to 1,100 pounds.....per cental..	3 25	to	4 25	3 00	to	4 25

Live-stock markets—Continued.

Articles.	August.		September.	
CHICAGO—Continued.				
Common cattle, in decent flesh, 700 to 1,050 pounds ... per cental	$3 00 to	$4 25	$2 75 to	$4 00
Texans, north-wintered ... do	3 25 to	4 50	3 25 to	4 25
through droves ... do	2 00 to	2 75	1 50 to	2 75
Sheep ... do	2 90 to	4 75	3 00 to	4 50
Hogs, good to choice ... do	4 20 to	4 50	4 25 to	——
SAINT LOUIS.				
Cattle, choice native steers, 1,300 to 1,600 pounds ... per cental	5 50 to	6 00	5 25 to	5 75
prime second-class natives, 1,150 to 1,400 pounds ... per cental	5 00 to	5 50	4 75 to	5 25
good third-grade native, 1,050 to 1,300 pounds ... per cental	4 50 to	5 00	4 00 to	4 50
fair butchers' steers, 1,000 to 1,200 pounds ... per cental	4 00 to	4 50	3 50 to	4 00
light, uneven stock-steers, 500 to 850 pounds ... per cental	3 50 to	4 00	3 25 to	3 75
good Texans and Cherokees, corn-fattened ... per cental	3 50 to	4 00	2 75 to	3 25
common and inferior, corn-fed Texans, per cental	2 75 to	3 25	2 00 to	2 50
inferior to common Texans ... do	1 50 to	2 00	1 50 to	2 00
veal calves, common to choice, per head	6 00 to	7 00	——	——
cows with calves ... do	——	——	——	——
Sheep ... per cental	4 25	——	3 20 to	3 50
Hogs, extra grades, gross ... do	4 35 to	4 40	4 50 to	5 00
fair to good, gross ... do	4 15 to	4 30	4 10 to	4 50
common to medium, gross ... do	4 00 to	4 10	4 00	——
Horses, good driving animals, ... per head	125 00 to	175 00	125 00 to	175 00
extra driving animals ... do	——	225 00	——	225 00
common to fair animals ... do	90 00 to	125 00	90 00 to	125 00
heavy draught-horses ... do	120 00 to	185 00	120 00 to	185 00
extra ... do	——	230 00	——	230 00
Mules, good heavy animals ... do	120 00 to	190 00	120 00 to	190 00
extra ... do	——	225 00	——	225 00
15½ to 16 hands high ... do	120 00 to	150 00	120 00 to	150 00
extra ... do	——	180 00	——	180 00
NEW ORLEANS.				
Cattle, Texas beeves, corn-fed, second quality, per head	40 00 to	50 00	40 00	50 00
Texas beeves, choice ... do	——	50 00	——	50 00
first quality ... do	35 00 to	45 00	35 00 to	45 00
second quality ... do	20 00 to	28 00	20 00 to	28 00
western beeves, ... per cental	12 00 to	15 00	10 00 to	15 00
milch-cows ... per head	35 00 to	50 00	35 00 to	50 00
milch-cows, choice ... do	80 00 to	100 00	80 00 to	100 00
calves ... do	7 00 to	10 00	7 00 to	10 00
Hogs, gross ... per cental	6 00 to	7 00	6 00 to	7 00
Sheep, first quality ... do	4 00 to	5 00	4 00 to	5 00
second quality ... do	3 00 to	4 05	3 00 to	4 05

FOREIGN MARKETS.

WHEAT.—The conditions of vegetation in the British Islands, during June and July, were, on the whole, favorable to the growth and gathering of the grain crops, yet in many localities the wheat crop fell below that of the previous year. In France the growth of this cereal was in several departments considerably interrupted by rain-storms. The general yield was reported very short, though the deficiency was largely made up by the superior quality and weight of the grain. In Germany only a fair crop was expected at the close of harvest, whereas the previous indications had pointed to a bountiful yield. In Hungary, too, a reported improvement was found to have been overrated, while the prevalence of cholera threatened a failure of labor in taking care of the crop. The London prices continued remarkably steady; the brilliant weather for gathering the crop atoning, in some measure, for deficient yield and exhausted stocks. The California crop had been over estimated, and hence its effect in supplying the deficiency was not so great as had been anticipated. In Southern Russia drought had prevailed extensively, with considerable blight, precluding the hope of exuberant supplies from that quarter. New crop supplies at Alexandria, in Egypt, were reported as inferior in quality. On the whole the outlook was to a higher market rate.

The sales of English wheat noted in the Mark Lane Express during the nine weeks ending with August 3, amounted to 270,952 quarters against 377,630 quarters during the corresponding period of 1872. During the first half of these periods the prices of 1872 were the highest, but during the last four weeks the preponderance turned in favor of 1873. The imports of foreign wheat into the United Kingdom, during the eight weeks ending July 26, amounted to 6,307,160 quarters. The London weekly average prices during the nine weeks ending August 3 were as follows: Week ending June 7, 54*s.* 3*d.* per quarter on 1,746 quarters; June 14, 57*s.* 6*d.* on 3,614 quarters; June 21, 56*s.* 8*d.* on 2,945 quarters; June 28, 56*s.* 10*d.* on 2,930 quarters; July 5, 56*s.* 8*d.* on 1,376 quarters; July 12, 57*s.* 2*d.* on 1,457 quarters; July 19, 56*s.* 5*d.* on 1,131 quarters; July 26, 56*s.* 9*d.* on 1,686 quarters; August 2, 57*s.* 5*d.* on 1,038 quarters.

The Mark Lane (London) prices during this period were as follows: English wheats—Essex and Kent, old white 60*s.* to 68*s.* per quarter; ditto new white, 51*s.* to 67*s.*; ditto old red, 59*s.* to 64*s.*; ditto new red, 51*s.* to 64*s.* Norfolk, Lincolnshire, and Yorkshire, old red 57*s.* to 63*s.* Foreign wheats—Dantzic, 60*s.* to 65*s.*; extra ditto, 68*s.* to 70*s.*; Konigsberg, 60*s.* to 65*s.*; extra ditto, 64*s.* to 68*s.*; Silesian, red, 57*s.* to 60*s.*; ditto white, 63*s.* to 64*s.*; Pomerania, Mecklenberg, and Uckermarck, red, 59*s.* to 62*s.*; Russian, hard, 50*s.* to 52*s.*; St. Petersburg and Riga, 55*s.* to 60*s.*; Danish and Holstein, 58*s.* to 60*s.*; American, 54*s.* to 59*s.*; California, 60*s.* to 61*s.*; Chilian, 60*s.*; Australian, 60*s.* to 64*s.*

Liverpool rates differed but little from those formerly reported. American white wheat brought from 13*s.* to 14*s.* per cental; ditto red, 12*s.* to 12*s.* 9*d.*; ditto spring No. 1, 12*s.* to 12*s.* 8*d.*; ditto spring No. 2, 11*s.* 4*d.* to 12*s.* 1*d.*; Canadian white, 12*s.* to 13*s.*; ditto red, 11*s.* 10*d.* to 12*s.* 8*d.*; California white, 11*s.* 8*d.* to 12*s.* 10*d.*; Chilian white, 11*s.* 4*d.* to 12*s.* 1*d.*; French white, 12*s.* 6*d.*; ditto red, 11*s.* 7*d.* to 12*s.* 1*d.*; Spanish white, 11*s.* 10*d.* to 12*s.* 4*d.*; Danubian, 7*s.* to 7*s.* 9*d.*; Girka, 10*s.* 4*d.* to 11*s.*; Egyptian, 9*s.* to 11*s.* 6*d.*; Australian, 12*s.* to 13*s.*

In Paris the prices per quarter about the 1st of August were, 66*s.* 6*d.*

for wheat from the south of France, 68*s.* 9*d.* for wheat from the west, and 65*s.* 6*d.* for that from La Vendee. A correspondent of the Mark Lane Express, under date August 2, reported that during the previous week 33 interior French markets had shown an advance in prices, 54 had remained unchanged, and 13 had declined or had shown a declining tendency. French wheat-growers were at that time very much occupied, and, having received good prices for their previous crops, were disposed to hold their stocks for a better market.

FLOUR.—The imports of flour into the United Kingdom during the eight weeks ending July 26, amounted to 824,984 cwt. The month of August opened with a small supply of English flour in London, but there was plenty of foreign, at least one-half of which was American, the remainder being Russian, Spanish, &c. The supply of country flour was limited, while millers were very cautious in investing in foreign grain on account of the apparent instability of the market, floating cargoes finding but slow sale. American red wheats, however, were quite firm. In Mark Lane prices were but little changed: best English town households brought 47*s.* to 55*s.* per sack of 280 pounds; best country households, 43*s.* to 47*s.*; Norfolk and Suffolk, 36*s.* to 43*s.*; American, per barrel, 26*s.* to 29*s.*; ditto, extra, 30*s.* to 31*s.* In Liverpool, August 2, English and Irish superfines brought 40*s.* to 42*s.* per 280 pounds; extra ditto, 43*s.* to 51*s.*; French, 48*s.* to 53*s.* 6*d.*; Spanish, 44*s.* to 46*s.*; Trieste and Hungarian, 64*s.* to 76*s.*; Chilian and Californian, 42*s.* to 48*s.*; American, per barrel, Western State, 28*s.* 6*d.* to 31*s.*; extra, ditto, 30*s.* to 34*s.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.*; Canadian, 32*s.* to 34*s.*

In Paris the flour market was mostly steady during July, with an improvement at the close of the month; the range of prices for consumption was from 48*s.* to 51*s.* 4*d.* per 280 pounds.

MAIZE.—*London:* White per quarter during June and July, 29*s.* to 30*s.* per quarter; yellow, 27*s.* to 28*s.* The supplies in the market largely increased about the 1st of August and met with a moderate demand at previous quotations. *Liverpool:* The prices for this grain about August 1st were, for American white, 30*s.* 6*d.* to 31*s.* per 480 pounds; ditto, yellow, 28*s.* to 28*s.* 6*d.*; Trieste, 27*s.* to 27*s.* 6*d.*; Danubian, 27*s.* 9*d.* to 28*s.*; Galatz, 28*s.* to 28*s.* 6*d.*

WOOL.—The English wool-market at the close of July had shown but little alteration. The standing quotations were: for Southdown hoggets, 1*s.* 7½*d.* to 1*s.* 8½*d.* per pound; half-breed, ditto, 1*s.* 8*d.* to 1*s.* 9½*d.*; Kent fleeces, 1*s.* 10*d.*; Southdown ewes and wethers, 1*s.* 5*d.* to 1*s.* 6*d.*; Leicester, ditto, 1*s.* 8*d.* to 1*s.* 9*d.* At public sales of colonial wool, the attendance was good and biddings animated at the higher range of prices.

LIVE STOCK.—During the last week in July the total imports of foreign stocks into London embraced 12,879 head of cattle against 13,159 in the corresponding week of 1872, 21,993 in 1871, 9,884 in 1870. The prices (per 8 pounds, to sink the offal) for coarse, inferior beasts, 4*s.* 8*d.* to 5*s.* 2*d.*; second quality, 5*s.* 4*d.* to 5*s.* 8*d.*; prime, large oxen, 5*s.* 10*d.* to 6*s.* 2*d.*; prime Scots' short-horn, &c., 6*s.* 2*d.* to 6*s.* 4*d.*; coarse and inferior sheep, 4*s.* 10*d.* to 5*s.*; prime Southdown, 6*s.* 2*d.* to 6*s.* 4*d.*; large hogs, 4*s.* to 4*s.* 4*d.*; small porkers, 4*s.* 8*d.* to 5*s.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

OCTOBER, 1873.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1873.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
Statistical Division, October 18, 1873.

SIR: I present herewith for publication a report of the October returns, showing the condition of growing crops; some facts concerning the comparative yield of cereals in various countries in connection with the causes of declining or improving rates of production; a statement illustrative of the condition of agriculture in Persia; tables giving the market prices of certain farm products in this country; and a variety of matter from the entomoligist, the chemist, and the botanist of the Department.

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS.

REPORT OF CROP RETURNS.

CORN.

The present year, like that of 1869, which produced the crop returned in the census of 1870, is one of low production, as regards maize, our main cereal, both in quantity and quality; while the quantity of wheat will be rather more than an average, in view of its increased area, though not equal to the great wheat-crop of 1869. This result is far better for farmers and consumers than a deficient yield of wheat with a large crop of corn, as the surplus of the former above the actual wants of bread-consumers is quite small; but two hundred millions of bushels of corn can always be spared from a full crop without any other effect than an enhancement of prices to a figure representing more fairly the cost of production. The flexibility of the corn consumption is unexampled in the case of any other crop, other feeding-material, much of which in years of abundance is wasted or improperly utilized, being substituted for maize whenever a deficiency in that crop is realized. There is always enough of corn-fodder wasted to feed an immense number of cattle; and in certain sections the farm-stock is half subsisted upon straw, notwithstanding the deliberate burning of nine-tenths of it to get it out of the way. The resources of fall and winter pasturage are also utilized. While these materials supply the place of hay rather than corn, and serve to winter rather than fatten farm-stock, they do render possible a less lavish use of corn than obtains in seasons when it becomes a drug at 20 cents per bushel.

Frosts have been early this year. Several New York correspondents refer to those of the 14th and 15th of September; the dates most fre-

quently mentioned are, in Pennsylvania, September 14, 15, 20, and 22; in Ohio, 20 and 21, but no injuries reported within a few miles of Lake Erie; in Michigan, 21; Indiana, 14, 15, 19, 20; Illinois, 13, (McHenry,) 14, 19, 20, 25, (Cumberland;) Wisconsin, 13, 14; Iowa, 10, (Plymouth,) 13, 14, 19; Kansas, 12, 22. These frosts were not generally of great severity, but sufficient to prevent the thorough ripening of the corn. The "average condition" of the crop throughout the country, as calculated with reference to the amount of production in each county, from the returns of county averages, is 84.

In October of last year the report read: "The average for all the States is 108. This promises one of the largest corn-crops ever produced." These figures indicate a depreciation this year, as compared with last, of 22 per cent., while the assumed reduction of 4 per cent. in area would enlarge this rate of depreciation. In round numbers the reduction in indicated product is 250,000,000 bushels, with the possibility that the final returns of November, which are direct estimates of the quantity as compared with the last crop, may still further reduce these figures.

The only States returning average condition are Georgia, Florida, Arkansas, California, and Oregon. The other averages are as follows: Maine, 85; New Hampshire, 99; Vermont, 97; Massachusetts, 97; Connecticut, 89; New York, 89; New Jersey, 99; Pennsylvania, 93; Delaware, 76; Maryland, 91; Virginia, 99; North Carolina, 95; South Carolina, 89; Alabama, 92; Mississippi, 86; Louisiana, 92; Texas, 78; Tennessee, 91; West Virginia, 96; Kentucky, 94; Ohio, 88; Michigan, 88; Indiana, 84; Illinois, 67; Wisconsin, 88; Minnesota, 97; Iowa, 81; Missouri, 76; Kansas, 66; Nebraska, 77.

MAINE.—*Piscataquis:* Far below last year's crops. *Oxford:* Very backward: killed by frost. *Waldo:* Yield very light, quality fair. *Androscoggin:* Backward: not over three-fourths of a crop.

VERMONT.—*Franklin:* Good condition; good yield. *Orleans:* Caught by frost early in September.

CONNECTICUT.—*New London:* Shortened by drought, especially late planted.

NEW YORK.—*Steuben:* Killed by frost September 15. *Genesee:* Improved. *Franklin:* Killing frosts September 14. *Washington:* Heavy frosts in the first half of September injured the crops materially. *Rockland:* White frost September 14, but not much damage. *Delaware:* Considerably damaged by frost. *Sullivan:* Injured by frost September 14. *Ontario:* Some pieces injured by frost. *Seneca:* Fair.

NEW JERSEY.—*Cumberland:* If frost delays the crop will be extra. *Worcester:* Considerable corn yet liable to be injured by frost. *Burlington:* Injured by hail in some places; if frost holds off the crop will be full average. *Essex:* Frost injured fodder to some extent.

PENNSYLVANIA.—*Clinton:* A large percentage of the crop delayed by bad seed, and threatened by the early frosts. *York:* Weather remarkably fine for corn. *Westmoreland:* Severe frost September 22; there will be much soft corn. *Warren:* Late plantings injured by frost September 15. *Indiana:* One-third of the crop will be soft. *Lawrence:* Hill crops injured by frost: first heavy frost September 15. *Armstrong:* Heavy frosts, September 28, set farmers to cutting corn not yet ripe. In some places corn was frost-killed. *Butler:* Early frosts September 14 to 22 injured the crop. *Crawford:* Frosts of September not severe, yet they damaged corn somewhat. *Erie:* Bad start, and never recovered; one-fourth short. *Washington:* Fodder damaged by frosts; there will be much soft corn. *Bucks:* Yield very disappointing; high winds of September broke down the stalks.

MARYLAND.—*Saint Mary's:* Greatly improved by late rains, but injured by cutworms. *Baltimore:* Good season and good cultivation made a good crop. *Howard:* Greatly improved by late rains and fair weather.

VIRGINIA.—*Powhattan:* Splendid condition. *Washington:* Rather light. *Spottsylvania:* Very fine: late plantings about ripe. *Pulaski:* Short, but better than was expected. *Matthews:* Shorter than for many years; not near enough for home consumption. *King George:* Excellent, except in the southeastern part of the county, where it was shortened by drought. *Rappahannock:* Good, but late: would be greatly injured by frost within two weeks. *Pittsylvania:* Rain came four weeks too late for corn. *Page:* Early Darling sugar-corn from the Department has done well: excellent for early table use. *Lunenburgh:* September very favorable for corn. *Alexandria:*

Sowed corn becoming a favorite crop and very profitable, taking the place of hay, which commands $30 per ton. *King William:* Shortened by drought more than other crops. *Nelson:* Wonderfully brought out by the rains of August; crop fine where it has been well cultivated. *Halifax:* Rains too late to save corn. *James City:* Largely above average in the lower parts of the county, where there were heavy rains; elsewhere it is inferior. *Prince George:* Very poor: did not recover from the July drought. *Orange:* Best corn-crop since 1865. *Chesterfield:* Frost September 16. *Montgomery:* Suffered from drought in half the county, making about half a crop; in the other half the weather was seasonable and the yield good. *King and Queen:* Late plantings greatly benefited by rains. *Highland:* Injured by grub-worms. *Northampton:* Shortened by drought. *Southampton:* Materially injured by rains. *Princess Anne:* Corn-fodder below average.

NORTH CAROLINA.—*Gaston:* A large yield, except in overflowed bottoms. *Sampson:* Partial failure through excessive rains. *Madison:* Better than was expected, but not so good as last year: acreage increased 10 per cent. *Currituck:* Cut off by rains. *Alamance:* Average in quantity and quality. *Martin:* Fair average where well tended. *Person:* Very much injured by drought. *Perquimans:* Twenty to twenty-five per cent. short of last year's crop. *Bladen:* Looks well. *Yadkin:* Not so good as was expected, but nearly average. *Caldwell:* Summer too wet for corn. *Cumberland:* Rains have interfered with the saving of fodder. *Anson:* Fair. *Greene:* Only three-fourths average; very discouraging to farmers.

SOUTH CAROLINA.—*Chester:* On bottoms 50 per cent. less than last year; late upland plantings good. *Greenville:* Upland corn bears two ears to the stalk; usual crop from nothing to a nubbin, or one good ear per stalk. *Clarendon:* Partial failure in some localities; good in others. *Newberry:* Light crop. *Orangeburgh:* Pennsylvania Yellow ripens early, but the ears are small. *Lexington:* Both late and early corn injured by rains. *Union:* Fair.

GEORGIA.—*Hart:* Fine crop; good season. *Gwinnett:* Good; Cooley White from the Department a success. *Jefferson:* Crop average. *Calhoun:* Good. *Heard:* Extra good. *Wilkinson:* Turning out well. *Brooks:* Great injury from storm, September 19.

FLORIDA.—*Suwannee:* White Cooley excellent; corn crop the best in ten years. *Jackson:* Size and weight of grain above average. *Orange:* Fair.

ALABAMA.—*Greene:* Poor; below expectation. *Clarke:* Better than last year, but shortened by excessive rains and grass. *Tuscaloosa:* Good. *Geneva:* Exceedingly good. *Winston:* Better than was expected. *Sanford:* A failure on bottom-land; too much rain. *Randolph:* Generally good. *Crenshaw:* Equal to last year.

MISSISSIPPI.—*Tishemingo:* Better than usual, except on bottoms. *Lee:* Three-fourths of a crop. *Grenada:* Short crop. *Pike:* Generally good. *Attala:* Short crop. *Holmes:* Crop fair, but not so heavy as usual.

LOUISIANA.—*Terre Bonne:* A miserable failure. *Rapides:* Will not suffice for bread till January. *Bossier:* An unusual amount of rotten corn.

TEXAS.—*Navarro:* Weather favorable for gathering the crop. *Cooke:* Almost a failure; no rain worth mentioning since June 9. *Dallas:* Below average. *Fayette:* Light, but in good condition. *Titus:* Over average, but not so good as was expected. *Red River:* Poor. *Upshur:* Shortest crop in thirteen years. *Medina:* Damaged by floods. *San Saba:* Light and inferior. *Uvalde:* Damaged 25 per cent. by bud-worms.

ARKANSAS.—*Sebastian:* Shortened a third by drought. *Perry:* Corn-crop supplemented by a large mast-crop. *Baxter:* Shortened by drought. *Arkansas:* Good crop. *Scott:* Injured by dry-rot and worms. *Ashley:* Short.

TENNESSEE.—*Lawrence:* Greatly shortened by drought; corn 80 cents and corn-meal $1 per bushel. *Grundy:* Suffered from cut-worms. *Fayette:* Half a crop. *Rhea:* Not filling out very well. *Jackson:* White, Cooley, and Yellow Field-corn are good varieties for this region. *Trousdale:* Greatly injured by drought. *Bradley:* Injured by grasshoppers. *Dyer:* Damaged by drought; no rain for two months. *Monroe:* Full average. *Smith:* Fully matured and in good condition in half the county; indifferent in the other half. *Carter:* Too wet for corn. *Jefferson:* Condition, full average, quantity, above. *Blount:* Moderately good; injured by drought. *Obion:* Spring too wet for corn. *Macon:* Brought out finely by late rains. *Haywood:* Shortened by drought.

WEST VIRGINIA.—*Fayette:* Not as good as expected; good rains all summer. *Mercer:* Great failure on account of grub-worms. *Grant:* Vast quantities of corn frost-bitten. *Braxton:* Mostly cut, and of good quality; supplemented for hog-feed by a large acorn-crop. *Berkeley:* Much soft corn, resulting from worms whose ravages required frequent replantings.

KENTUCKY.—*Jefferson:* Season fine; crop unusually good. *Shelby:* Condition equal to last year; yield, 15 per cent. greater. *Daviess:* Will yield a million bushels. *Metcalfe:* Not so good as last year; unfavorable season and storms have injuriously affected it. *Spencer:* Disappointing the promise of August. *Russell:* Sound, but not over a half crop. *Laurel:* Beyond expectation; short, but good. *McLean:* Shortened 10 per cent. by drought.

OHIO.—*Stark:* Later than usual and already damaged by frosts materially. *Coshoc-*

ton: Slightly injured by frost September 20. *Crawford:* Late, and already frost-bitten. *Medina:* Below average; frosted in low grounds. *Erie:* Frost did considerable damage at points six or eight miles from Lake Erie, but along the lake there has been none. *Huron:* Hurt by frost considerably September 20 and 21; fodder will be scarce. *Auglaize:* Early frost injured corn and fodder. *Geauga:* Large growth of stalk but light ears. *Mahoning:* Injured by frost September 20. *Adams:* Weather seasonable for corn since June; good crops in spite of chinch-bugs in some places. *Delaware:* Early plantings a good average crop; late plantings intercepted by frost and will be about half a crop. *Defiance:* First killing frosts September 20 and 21; some damage. *Athens:* Average; would have been greater but for the July flood.

MICHIGAN.—*Lenawee:* First frost September 20. *Wayne:* Upland crops shortened by drought. *Branch:* Not over two-thirds of an average. *Ottawa:* Heavy growth of fodder, but not well eared or grained; frosts nearly every night for two weeks; too dry for corn. *Shiawassee:* Heavy frost September 21; grain less injured than fodder.

INDIANA.—*Huntington:* Considerable corn frosted; first frost September 9, ten days earlier than last year. *Madison:* Injured by heavy frost September 19 and 20. *Ohio:* Injured by frost September 15, 22, and 23. *Steuben:* A little over a half crop. *Floyd:* Crops made before the drought: never better. *Brown:* Early plantings very good; late a little frosted September 14 and 15. *Dearborn:* Matured rapidly; out of danger. *Hamilton:* A great deal of corn will be frosted. *Cass:* Poorest crop for many years; three-fourths more or less injured by frost. *Howard:* Damaged by frost September 14; a large portion will be unmerchantable. *Johnson:* Frost causing corn to shrink and become loose on the cob. *Marion:* Seriously injured by frost. *Martin:* Late corn damaged by drought. *Montgomery:* Sharp frosts; heavy mast in the woods. *Noble:* Considerable soft corn. *Shelby:* Badly damaged by frost. *Warren:* Hurt by white frost September 13. *Fulton:* Frosted. *Decatur:* Well matured and sound on ditched lands; on others a failure through wet season. *Scott:* Injured by chinches. *Hancock:* Injured by wet and early frost. *Franklin:* Ripening well.

ILLINOIS.—*De Kalb:* Corn frost-killed in some localities. *Jersey:* Late corn injured by frost. *Franklin:* Early planted never better; the whole crop in August promised to excel any former crop, but dry weather and chinch-bugs have ruined late plantings. *Macon:* Mostly out of danger though some late plantings have been frosted. *Winnebago:* Late corn killed by severe frost during the first week in September. *Bureau:* Many pieces poor and soft; others very good. *Clinton:* Much injured by drought and chinch-bugs. *Edwards:* Fine in spite of chinch-bugs. *Vermilion:* Light, and badly injured by frost; but little more than half of last year's yield, and half of that unmerchantable. *Sangamon:* Late plantings injured by frost. *Washington:* Late corn injured by drought and chinch-bugs. *Carroll:* Killing frost September 14. *Champaign:* Late plantings entirely failed; earlier plantings safe. *Cumberland:* Largely injured by frost September 25. *Kankakee:* Half spoiled by late planting. *Massac:* Injured by drought. *Moultrie:* Reduced to a fourth of a crop by drought and early frost. *Pope:* Injured by chinches. *Putnam:* Blades extensively killed by frost September 14, 19, and 20. *Ogle:* Injured by frost September 14. *Piatt:* Late corn frosted. *McHenry:* First severe frost September 13; fodder destroyed and grain injured. *Mason:* Late corn badly frosted. *McLean:* Late corn injured by frost on the 13th September and killed on the 20. *Knox:* Late plantings mostly a failure. *Montgomery:* Fall very favorable to corn, which is late.

WISCONSIN.—*Marathon:* Much damage by heavy frosts. *Dunn:* Heavy frosts September 13 and 14. *Clark:* Crop saved before frost; raised only for home consumption. *Waukesha:* Generally ripe and in the shock before frost. *Douglas:* Injured by frost. *Green Lake:* Suffered from August drought. *Richland:* Heavy frost September 14. *Green:* Late plantings badly frosted. *Vernon:* Injured by drought.

MINNESOTA.—*Ramsey:* Good where well cultivated. *Mower:* Ripened before the September frosts; good condition. *Nicollet:* Small crop; wet spring and poor seed. *Red Wood:* Considerably frosted. *Blue Earth:* Heavy frosts, but corn out of their way.

IOWA.—*Montgomery:* Unripe corn killed by frost September 19. *Marion:* Injured by drought. *Sioux:* Damaged by grasshoppers. *Tama:* Heavy frosts. *Cass:* Shortened by drought nearly 40 per cent. *Clinton:* Heavy frost September 19. *Allamakee:* Frost-bitten September 13 and 14. *Calhoun:* Good, though somewhat late. *Chickasaw:* Injured by drought on sandy soils, especially along river-bottoms. *Harrison:* Late planted and injured by drought and grasshoppers. *Mahaska:* Hardening finely, but will be short. *Union:* Shortened by drought from June. *Johnson:* Shortened by drought; almost a failure on clay land; fair crops in some localities. *Muscatine:* Early plantings good; late plantings poor. *Pocahontas:* Nearly as good as common. *Jefferson:* Damaged by drought. *Carroll:* Pennsylvania corn did well. *Grundy:* Light crop, but ripened well; September frosts did little damage. *Hardin:* Considerably frosted. *Scott:* Shortened by drought. *Plymouth:* Heavy frost September 10. *Mills:* First heavy frost September 19. *Mitchell:* Excellent. *Monona:* Probably not over a half crop.

MISSOURI.—*Benton:* Shortened by drought continuing from July 15; on prairie lands the crop will be of inferior quality. *Adair:* Better than was expected. *Polk:* Damaged by chinch-bugs and drought. *Clinton:* Shortened by drought; unripe corn frosted September 18. *Cole:* Reduced by drought to a half crop in many places. *De Kalb:* Half crop. *Mercer:* Good. *Pulaski:* Injured by drought and chinch-bugs. *Stone:* Not over a fourth of a crop. *Newton:* A little injured by drought and chinch-bugs. *Grundy:* Short 50 per cent. *Pettis:* Shortened by drought to a half crop. *Shelby:* Light, and poor through drought. *Linn:* Shortened by frost.

KANSAS.—*Labette:* Early plantings, which escaped the chinch-bugs, are fine; late plantings worthless. *Woodson:* Injured by heavy storms and much of it killed on the high lands by frost September 22. *Clay:* Greatly damaged by drought. *Montgomery:* Damaged by bugs. *Coffey:* About two-thirds of a crop. *Douglas:* Late plantings a failure. *Nemaha:* Half crop; a fourth of last year's crop on hand. *Smith:* Damaged by grasshoppers. *Reno:* Averaging from 50 to 60 bushels per acre. *Wilson:* Almost destroyed by chinches on the uplands; bottom crops escaped. *Wabaunsee:* Cut down one-half by drought; only two or three showers since July 1. *Shawnee:* Frost September 12. *Atchison:* Frosts a month earlier than usual.

NEBRASKA.—*Madison:* Better than was expected. *Nemaha:* Decreased corn-crop has prevented many from fattening cattle. *Cass:* Not over a half crop.

OREGON.—*Clackamas:* Slightly injured by recent frosts.

COLORADO.—*Weld:* Killing frost September 28.

UTAH—*Iron:* Corn green and growing; no frost yet. *Kane:* Large crops; season propitious. *Tooele:* Improved by late rains.

IDAHO.—*Ada:* Pennsylvania corn the best variety here; that planted May 10 is well matured and a heavy crop.

NEW MEXICO.—*Taos:* Will be average if frost delays a month longer; otherwise it will be as light as wheat.

WHEAT.

The returns of September, averaged with reference to the production of each county, indicated nearly a full normal crop, the average depreciation being only 5 per cent. The returns of October are made in direct comparison with the crop of last year, involving, of course, the element of area as well as condition. The aggregate is an increase of about 4 per cent., which is equivalent to ten millions of bushels, making the promise of the crop about 260,000,000. This may be considered a good crop, as large as any harvested since 1869, but about 10 per cent. less than that unusual yield.

The great difference between the rates of yield in the several States in 1872 necessarily makes a wide range in the percentages in comparison with each State product. Minnesota is credited with an increase of 20 per cent.; Wisconsin with 18; Iowa, 12; Illinois, 6; Missouri, which had less than two-thirds of a crop last year, has made an increase of nearly 50 per cent., and Kansas has almost as large an increase over the poor crop of last year. Ohio's crop is placed at 2 per cent. above that of last year. Kentucky has 8 per cent. less than last year, and Indiana 12 per cent., and California 16 per cent. Of the other States which make considerable contributions to the aggregate, Pennsylvania has an increase of 34 per cent., which barely makes an average crop, and New York, with 5 per cent. increase, has still little more than two-thirds of a good crop. The crop of the South is less than that of last year.

Among the large wheat-producing counties of the western wheat belt, such as produce not less than half a million bushels in a good season, the following will serve to indicate the sections in which the present season has been propitious, or otherwise: In Ohio, Miami, Montgomery, Champaign, Highland, Franklin, Fairfield, Shelby, and Wayne show an increase; and Stark, Richland, Sandusky, Wyandot, and Holmes a decrease. In Michigan, Livingston, and Barry make an increase, and Cass, Clinton, Kalamazoo, Calhoun, Hillsdale, Jack-

son, Lenawee, Saint Joseph, and Washtenaw, a decrease; in Indiana, Randolph is reported at 130, while the range is from 75 to 90 in Carroll, Hamilton, Johnson, Madison, Montgomery, Shelby, and Warren; in Illinois, several of the heavily producing counties of the southwest, as Jersey, Macoupin, Montgomery and Adams, range from 75 to 95 in comparison with the previous crop, and in the northwest a marked appreciation is seen in Ogle, Carroll, Winnebago, and Stephenson. Several other prominent counties, among them Pike, Washington, and Clinton, show an increase. Sheboygan is the only half-million county in Wisconsin which reports a depreciation, while among those making gains ranging from 5 per cent. to 100 are Green Lake, Jefferson, Walworth, Dodge, La Crosse, Iowa, Green, Buffalo, La Fayette, Saint Croix, and Waukesha. A single one of these, Dodge, produces between two and three millions of bushels. All prominent counties reporting from Minnesota return 100 or more. Olmstead, which produced more than two millions of bushels in 1869, 105; Blue Earth, 100; Freeborn, Wabashaw, Fillmore, 110; Washington, 115; Mower, 125. In Iowa, the counties of Tama, Grundy, Marshall, and Scott return less than 100; Iowa, Clinton, Johnson, and Linn report the same as last year; Black Hawk, 125; Benton, 110, (these two counties producing between one and two millions each;) Chickasaw, 130; Delaware, 125; Floyd, 115; Allamakee, Hardin, and Jones, 105. Among the prominent counties in Missouri making a favorable comparison with last year are Cass, Gasconade, Lincoln, Perry, and Saline. Moniteau returns 75. Bourbon, Marshall, and Nemaha, in Kansas, and Cass, Otoe, and Gage, in Nebraska, make favorable comparison. In most of the wheat-producing counties of California a depreciation is indicated, as in Alameda, Contra Costa, Santa Clara, and Stanislaus.

The following extracts from correspondence will further illustrate local conditions:

MAINE.—*Oxford:* Pinched by drought; quality poor.

NEW HAMPSHIRE.—*Carroll:* Does not thrash out as well as was expected; grains shrunk through drought.

MASSACHUSETTS.—*Berkshire:* Winter-grain good; protected by snow in winter.

CONNECTICUT.—*New London:* Superior quality.

NEW YORK.—*Livingston:* Winter-wheat of first-rate quality. *Greene:* Less than 40 per cent. of a full crop. *Seneca:* About 70; quality good.

NEW JERSEY.—*Sussex:* Wheat-crop larger and of better quality than last year. *Cumberland:* Good. *Burlington:* Thrashing out satisfactorily; Fultz wheat has fulfilled the most sanguine anticipations. *Morris:* Very good; better than for many years. *Warren:* Good quality and unusual weight per bushel.

PENNSYLVANIA.—*Northampton:* Large crop of excellent quality; large increase over last year. *Chester:* Crop not sufficient for home consumption. *Mifflin:* Nearly double last year's crop. *Lebanon:* A quart of Tappahannock from the Department yielded 26½ quarts, perfectly clean and of the best quality.

MARYLAND.—*Baltimore:* Better than last year in quantity and quality; a good average. *Howard:* Better than last year's crop, which was good. *Cecil:* Wheat sown about October 1 did well; earlier sowed, injured by the fly, and later by freezing.

VIRGINIA.—*Pulaski:* Short crop; poor seed and unpropitious season; season fine for sowing, but unfavorable to breaking up fallow. *King George:* Injured by rain in shock and stack; more than usual fallow ground put in wheat. *Botetourt:* Falling short on thrashing; weather fine for seeding. *Stafford:* Much injured by rain; some of it coming to market in bad condition. *Orange:* Yielded badly and was injured in stack and shock. *Montgomery:* A signal failure; many farmers will not get back their seed. *Highland:* Largely frozen in winter. *Bath:* Fultz the best variety here.

NORTH CAROLINA.—*McDowell:* Lowland crops largely injured by high waters. *Forsyth:* Short, but good. *Perquimans:* Will soon cease to be grown. Yield, 4 bushels per acre.

SOUTH CAROLINA.—*Greenville:* Wheat from 2½ to 9 bushels per acre. *Union:* Poor; very little attention to it when cotton brings 18 cents per pound.

GEORGIA.—*Barbour:* Tappahannock a success. *Cobb:* Tappahannock has taken the first premium at all the State and county fairs.

TEXAS.—*Fannin:* A half bushel of Tappahannock produced 39½ bushels weighing 64 pounds each. *Titus:* Great improvement, both in quantity and quality. *Upshur:* Did well. *Ellis:* Twice as much wheat gathered as last year, but will be light in weight on account of rains during harvest. *Uvalde:* Damaged by grasshoppers.

ARKANSAS.—*Montgomery:* Injured by wet in the shock.

TENNESSEE.—*Jackson:* Half gallon of Tappahannock, broadcast, thrashed out 2 bushels of nice full grain; the same quantity of Fultz produced 3½ bushels. *Bedford:* But little over a half crop; quality inferior; affected by sweat and scab. *Sullivan:* Tappahannock taken by the fly; Fultz comparatively free from the ravages of the fly, and appears to be otherwise hardy and prolific. *Dickson:* Almost ruined by scab; some "sick wheat;" none of as good quality as last year. *Knox:* Black weevil has eaten up many lots of wheat; Fultz a success and very popular. *Monroe:* Poor; quality under par. *Lincoln:* Tappahannock did well; 4 quarts produced 2½ bushels. *Carter:* Much of the white wheat is of good quality, but red is considerably damaged by scab. *Montgomery:* Some "sick wheat" reported. *Blount:* Forty per cent. short, and inferior in quality.

WEST VIRGINIA.—*Tyler:* Quality generally good. *Brooke:* Injured by wet in the stack; otherwise it would have been above average. *Fayette:* Plump and heavy. *Jefferson:* Did not thrash out as well as was expected; quality good. *Mercer:* Half crop; quality inferior; injured by midge. *Braxton:* Yield generally satisfactory. *Harrison:* A half bushel of Fultz yield 3½ bushels in spite of winter-freezing; it stands winter better than Tappahannock wheat.

KENTUCKY.—*Russell:* Not over a half crop; injured by spot; some "sick wheat;" difficult to get good seed.

OHIO.—*Vinton:* Fultz promises to supersede all other wheat. *Montgomery:* Fultz very successful; from 3 quarts sown in 1871 were produced 3 bushels in 1872, and 99 bushels in 1873. *Medina:* Thrashes out of good quality and abundantly. *Geauga:* Average yield of excellent quality. *Licking:* From 4 quarts of Tappahannock badly winter-killed was harvested a bushel of very good wheat. *Morgan:* Fultz from the Department very satisfactory; Tappahannock also did well, except on low grounds, where it rusted. *Delaware:* Season poor for wheat; yield reduced 25 per cent. *Athens:* Average; would have been above but for the July flood.

MICHIGAN.—*Branch:* Not over 60 per cent. of an average. *Calhoun:* Full average. *Lenawee:* Turned out better than was anticipated; quality first rate. *Clinton:* Sound and good, but less white than last year. *Cass:* Foul from winter-killing, but when cleaned it is equal to last year.

INDIANA.—*Steuben:* Harvested in prime condition. *Floyd:* Light and poor; flour dark. *Brown:* Thrashed out below expectation. *Hamilton:* Three bushels of Fultz yielded 60. *Noble:* Good yield. *Decatur:* Short, and damaged by rain in the shock. *Scott:* Injured by chinches. *Hancock:* Damaged in the shock by wet.

ILLINOIS.—*Macon:* Some kinds badly shriveled; Genesee the plumpest berry. *Winnebago:* Good. *Bureau:* Will average 16 bushels per acre of No. 1 quality; some fields reach 20 or 25. *Clinton:* Somewhat injured by wet before stacking. *Massac:* Injured by rain. *Pope:* Injured by chinches. *Ogle:* Average about 18 bushels per acre; quality good. *Lee:* Averages 20 bushels per acre of good quality. *Boone:* Yield light. *McLean:* Quality good; deficiency of fall-wheat compensated by increase of spring-wheat.

WISCONSIN.—*Crawford:* Largest area of fall-wheat ever sown. *Walworth:* Small amount grown. *Portage:* Red Osauka, thickly sown, yielded 20 bushels per acre. *Waukesha:* Fine; a little heavier per bushel than last year. *Juneau:* Heavy failures in New York cut wheat down from $1 to 70 cents per bushel. *Green Lake:* Thrashes out well; better than was expected. *Saint Croix:* Never better. *Vernon:* Winter-wheat better than it appeared.

MINNESOTA.—*Blue Earth:* Fair crop, of excellent quality. *Le Sueur:* Fine harvest weather. *Ramsey:* Fine crop; average 17 to 18 bushels per acre. *Mower:* Prices fell from 90 to 65 cents per bushel. *Martin:* Late sowings ruined by black rust; earlier of good quality, averaging from 10 to 16 bushels per acre. *Nicollet:* Red Osauka rusted badly; Scotch Fife did best.

IOWA.—*Sioux:* Damaged by grasshoppers. *Calhoun:* Damaged 10 per cent. by blight. *Chickasaw:* Splendid condition; best yield ever known here. *Harrison:* Will yield more per acre than last year; increased total yield and improved quality. *Iowa:* Increased acreage, but reduced yield per acre. *Muscatine:* Good in quantity and quality. *Pocahontas:* Injured by grasshoppers. *Carroll:* Provence wheat scabbed badly. *Shelby:* Provence and White Australian wheats failures; no case of Provence wheat ripening; Oran wheat is promising; Fultz has not done well. *Marshall:* Averages about 10 bushels per acre. *Mitchell:* Spring-wheat a large crop.

MISSOURI.—*Gasconade:* Tappahannock has excelled all other varieties both in quantity and in quality. *Montgomery:* Early-sown wheat damaged by grasshoppers, which have been driven off by frosts. *Carter:* Tappahannock our best wheat. *Mercer:*

Good. *Pulaski:* Light, but better than last year; injured by chinch-bugs. *Newton:* Good quality; 60 to 64 pounds per bushel.

KANSAS.—*Labette:* Wheat yield increased from 200,000 bushels last year to 500,000 this year; would have been a quarter million more but for the chinch-bugs. *Montgomery:* Damaged by chinch-bugs. *Cherokee:* Prime where not affected by chinch-bugs. *Cowley:* Very good quality; average between 15 and 20 bushels per acre, some fields reaching 35. *Washington:* Good and of good quality. *Atchison:* Thrashes out 15 per cent. better than was anticipated.

NEBRASKA.—*Madison:* Shortened by grasshoppers. *Cass:* Damaged considerably by blight. *Nuckolls:* Severely injured by frost September 18.

CALIFORNIA.—*Sonoma:* In spite of the lack of usual spring rains the wheat-crop thrashes out a third above last year's yield; quality of grain unusually good. *Contra Costa:* Yield generally beyond expectations; kernel bright and plump. *Alameda:* Price from $2.20 to $2.40 per cental.

OREGON.—*Lane:* From 30 to 50 per cent. above last year; price has risen from 60 to 85 cents per bushel. *Benton:* Spring-wheat the best. *Grant:* Unusually fine growing season for cereals. *Clackamas:* Crop larger and better than last year.

UTAH.—*Sevier:* Rust in wheat.

NEW MEXICO.—*Taos:* Almost a failure on uplands.

WASHINGTON.—*Lewis:* Never better. *Thurston:* White Dial weighs 66 pounds per bushel. Cook's white winter, Canada winter, and Australian spring are our best varieties.

OATS.

The oats crop averages 92. The product is equal to last year, or above, in Vermont, 102; Delaware, 117; Maryland, 109; Virginia, 120; North Carolina, 100; South Carolina, 112; Georgia, 117; Alabama, 117; Mississippi, 107; Texas, 120; Arkansas, 112; Tennessee, 110; West Virginia, 118; Kentucky, 104; Wisconsin, 104; Minnesota, 100; Kansas, 105; Oregon, 123; in all the other States the yield is decreased. An improved quality of grain is noted in Vermont, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Texas, Arkansas, Tennessee, West Virginia, Michigan, Wisconsin, Minnesota, Kansas, California, and Oregon. The Potato oats appear to have succeeded better in the more southern cotton States. In Clarendon County, South Carolina, they grew finely, but ripened two weeks later than other varieties. In Saint Clair County, Alabama, they grew nearly 7 feet high, and did well in Barbour. The Schonen oats maintained their reputation in Sullivan County, Tennessee, and Mercer and Harrison Counties, West Virginia. The Hopetown oats are well spoken of in Sullivan County, Tennessee, and the white Probestier in Isanti County, Minnesota.

MAINE.—*Oxford:* Injured by drought.

NEW HAMPSHIRE.—*Carroll:* Shortened by drought.

VERMONT.—*Rutland:* Shortened by drought; grain light in weight.

CONNECTICUT.—*New London:* Fair in spite of drought.

NEW YORK.—*Genesee:* Crop 60 per cent. of a full crop. *Sullivan:* Season too dry for oats. *Seneca:* Damaged by wet.

NEW JERSEY.—*Cumberland:* Injured by drought in June. *Morris:* Poor; straw very short. *Warren:* Quantity the same as last year, quality better.

PENNSYLVANIA.—*Cambria:* Short-strawed but well headed. *Washington:* Yield in bushels large, but light in weight.

MARYLAND.—*Baltimore:* Shortened by drought, but of fair quality. *Howard:* Shortened by drought. *Cecil:* Below average but heavy-grained.

VIRGINIA.—*Page:* A quart of Scotch potato-oats produced 16 quarts of inferior quality. *Pittsylvania:* Late sowings poor. *Prince George:* Schonen oats from the Department have yielded heavily, and are becoming very popular. *Highland:* Never better.

NORTH CAROLINA.—Above average, 20 per cent.

SOUTH CAROLINA.—*Clarendon:* Potato oats grow finely but ripen two weeks later than the black oats. *Orangeburgh:* Schonen did finely. *Union:* Best oats year we ever had.

ALABAMA.—*Barbour:* Excelsior and Potato oats did well. *Saint Clair:* Potato oats from the Department grew 6 feet 10 inches high. *Randolph:* Full crop.

LOUISIANA.—*Caddo:* By mistake in the last monthly report our crop was reported at an average of 80 bushels per acre instead of 80 per cent. of an average crop.

TEXAS.—*Titus:* Never better; free from rust and smut. *Red River:* Very fine. *Upshur:* Too short-strawed for cutting to advantage. *Uvalde:* Damaged by grasshoppers.

TENNESSEE.—*Sullivan:* Potato oats not suited to the climate; Schonen maintain their high reputation; Hopetown oats fine, bright-strawed, grain abundant, large, and bright. *Monroe:* Excellent. *Blount:* Crop larger and of better quality than usual.

WEST VIRGINIA.—*Brooke:* Injured in shock and stack by wet weather. *Mercer:* Above average. Schonen did well; superior to most other kinds; yield heavy. *Harrison:* White Schonen and Yellow Scotland oats both excellent.

KENTUCKY.—*Russell:* Very fine. *Spencer:* Shortened by rust. *Daviess:* The most promising crop ever known till spoiled, just at ripening, by heavy rains.

OHIO.—*Geauga:* Almost destroyed by grasshoppers. *Mahoning:* Badly injured by grasshoppers. *Vinton:* Injured by wet weather. *Athens:* Acreage reduced by wet spring, but yield and quality are good.

MICHIGAN.—*Lenawee:* Shortened by drought and rust. *Branch:* Twenty per cent. below average.

INDIANA.—*Steuben:* Harvested in prime condition. *Ripley:* Injured by chinch-bugs. *Noble:* Injured by drought. *Decatur:* Good, but saved with difficulty on account of rains. *Scott:* Injured by chinches.

ILLINOIS.—*Franklin:* Ten days before harvest the crop was remarkably promising, but heavy storms beat down the grain, rendering it very difficult to gather, and equally difficult to thrash. *Macon:* Late sowings badly blown down and imperfectly filled. *Bureau:* Crop short but of good quality. *Clinton:* Shortened by drought and chinches. *Washington:* Would have been above average but for rains just before harvest which beat down the grain. *Champaign:* Nearly destroyed by storms and worms. *Pope:* Injured by chinches. *Rock Island:* Half of last year's yield. *Ogle:* Reduced acreage; average yield 38 bushels per acre. *Lee:* Short and light in weight; straw better than last year for feeding stock. *Boone:* Deficient in quantity and quality; generally rusted. *Mason:* Yield less than last year, but quality 20 per cent. better. *McLean:* Inferior, but harvested without rain. *Knox:* Light in consequence of drought.

WISCONSIN.—*Green Lake:* Failed in some places. *Brown:* Very light.

MINNESOTA.—*Blue Earth:* Crop large and of good quality; acreage small. *Isanti:* White Probestier oats from the Department yielded heavily; they suit the climate well. *Nicollet:* Turn out reasonably well; good quality.

IOWA.—*Harrison:* Decreased acreage, but yield and quality good. *Muscatine:* Injured by drought. *Pocahontas:* Injured by grasshoppers. *Mitchell:* Fair.

KANSAS.—*Labette:* Shortened by drought and chinches. *Cowley:* Crop moderate. *Nemaha:* Half crop.

NEBRASKA.—*Madison:* Largely destroyed by grasshoppers, even in the shock.

OREGON.—*Grant:* Excellent; yield in some cases 60 bushels per acre.

IDAHO.—*Nez Percés:* Oats sown early on sod ground are yielding 50 and 60 bushels per acre.

WASHINGTON.—*Thurston:* Enormous crop, in some cases reaching nearly 90 bushels per acre; grain eight and a half feet high. *Lewis:* Never better; harvest delayed by wet.

RYE.

The general average of this crop is 98. An increased product, compared with last year, is shown in Massachusetts, Connecticut, New Jersey, Pennsylvania, Maryland, Florida, Arkansas, Missouri, Kansas, Nebraska, and Oregon; in all the other States the yield is less than that of 1872. The average quality shows improvement in Vermont, Connecticut, Pennsylvania, Texas, Michigan, Wisconsin, Minnesota, Iowa, Kansas, and Oregon. Maine, Massachusetts, New York, New Jersey, Maryland, Virginia, Florida, Ohio, and California report a quality of grain fully equal to last year; the other States are all below.

CONNECTICUT.—*New London:* Fair in spite of drought.

NEW JERSEY.—*Burlington:* Both grain and straw excellent.

PENNSYLVANIA.—*Cambria:* Fair. *Northampton:* Crops large and good.

MARYLAND.—*Baltimore:* Increased attention to rye culture.

GEORGIA.—*Marion:* Rye from the Department failed, while native grain beside it grew 6 feet high.

MISSOURI.—*Mercer:* White Scotch rye from the Department did well; 4 quarts of seed yielded 3 bushels.

BARLEY.

A general average of 88 per cent. of last year's crop is indicated. An increase is secured of 5 per cent. in Missouri, of 6 per cent. in West Virginia and Kansas, and of 19 per cent. in Oregon. The yield is equal to last year's in Connecticut. In all the other States it has declined, the greatest loss—28 per cent.—being in Minnesota. The quality is equal to last year's, or better in West Virginia, Kentucky, Missouri, California, and Oregon. No returns were received from Rhode Island, Delaware, Maryland, Virginia, North Carolina, South Carolina, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and Tennessee, where it is scarcely known as a crop.

BUCKWHEAT.

Buckwheat was of average condition, or above, in New Hampshire, Vermont, New Jersey, Delaware, Maryland, Virginia, Georgia, Arkansas, and West Virginia. In all the other States the crop declined below average, reaching its lowest point (64) in Iowa. Little is grown in Rhode Island, South Carolina, Florida, Mississippi, Louisiana, and California. In several of the Northern States the crop was injured by early frosts.

POTATOES.

This crop is above average in condition in eleven States, as follows: Vermont, 108; Massachusetts, California, and Oregon, 105; Connecticut and South Carolina, 104; New York, 107; New Jersey and Virginia, 101; Alabama, 110; Texas, 109. Rhode Island and Pennsylvania are average, and all the other States below; Iowa, 51; Nebraska, 56; Kansas, 58; Illinois, 59; Missouri, 61; Indiana, 77; the remaining States range between 68 in Delaware, and 98 in Maine, New Hampshire, and Georgia. For all the States, the average condition is 89. Some depredations by the Colorado beetle and other insects are noted in the Mississippi Valley and as far east as Pennsylvania, and the rot has prevailed to a limited extent in a few localities; but in the States in which the potato-crop is an important one, and which report a low condition, drought has been the chief cause. Our reports generally concur in representing the quality as unusually good.

MAINE.—*Piscataquis:* Drought severe on potatoes. *Waldo:* Excellent in quality. *York:* Heavy crops.

NEW HAMPSHIRE.—*Cheshire:* Very nice.

VERMONT.—*Rutland:* Excellent.

MASSACHUSETTS.—*Bristol:* Early potatoes affected by drought. *Norfolk:* Crop larger and better than usual.

CONNECTICUT.—*Hartford:* Better in quality than for forty years.

NEW YORK.—*Genesee:* Fine. *Franklin:* Worth 40 cents per bushel for food and 30 cents for starch-making. *Columbia:* Crop extra, but rotting. *Allegany:* Shortest crop in thirty years; some will not get back their seed and others not over half a crop.

NEW JERSEY.—*Sussex:* Early varieties shortened by drought: later plantings turning out very well.

PENNSYLVANIA.—*Cambria:* Potato-bugs very destructive and hard to exterminate; some rot. *Indiana:* Crop light: injured by bugs. *Westmoreland:* Potato-bugs do not appear to have done much damage. *Northumberland:* Uncommonly abundant and fine. *Armstrong:* Late potatoes not worth digging: destroyed by bugs. *Butler:* Late plantings diminished one-half by bugs. Early Rose a full yield.

MARYLAND.—*Baltimore:* Early crop light: later never better. *Howard:* Early plantings shortened by drought. *Cecil:* Early potatoes injured by drought: late ones very fine.

VIRGINIA.—*Highland:* Good.

GEORGIA.—*McDuffie:* Never better.

TEXAS.—*Wood:* Crop made before the drought set in, and hence good.

TENNESSEE.—*Madison:* Very poor crop. *Lawrence:* Much damaged by drought. *Dickson:* Late plantings shortened by drought and bugs. *Monroe:* Better than for several years. *Blount:* Probably a failure. *Fentress:* Good.

WEST VIRGINIA.—*Tyler:* Not much injured by bugs. *Brooke:* Poor crop; injured by Colorado-beetle. *Fayette:* About average. *Jefferson:* Late plantings did not fill well. *Marion:* Dug early to escape grub-worms. *Braxton:* Good. *Pleasants:* Much injured by bugs.

KENTUCKY.—*Jefferson:* A fair crop—say two-thirds average—will be gathered in spite of the bug. *Shelby:* Not over 40 per cent. of an average. *Russell:* Good.

OHIO.—*Warren:* Half crop, but good quality. *Crawford:* Saved from Colorado-beetles by Paris-green and systematic picking. *Erie:* Injured some by bugs but more by blight. *Geauga:* Bugs destructive; crop fine where these did not appear. *Mahoning:* Materially damaged by bugs. *Medina:* Late potatoes poor; decreased acreage. *Adams:* Acreage larger than ever before; yield per acre greater than usual. *Delaware:* Below average; season unfavorable.

MICHIGAN.—*Ottawa:* Injured by bugs. *Martin:* Late potatoes shortened by drought. *Cass:* Injured by drought and frost. *Mecosta:* Late potatoes frosted.

INDIANA.—*Steuben:* Small, but of excellent quality. *Hamilton:* Light crop. *Decatur:* Damaged by Colorado beetle and common bugs.

ILLINOIS.—*Jersey:* Potatoes scarce; late plantings almost a failure. *Macon:* Nearly eaten up by bugs; shortened also by drought. *Bureau:* Small and few. *Carroll:* Killing frost, September 14. *Massac:* Injured by drought. *Moultrie:* Reduced to a fourth of a crop by drought. *Pope:* Injured by drought. *Lee:* Nearly a total failure. *Boone:* Shortened by drought and bugs. *McLean:* Almost a failure. *Knox:* Late potatoes nearly a failure. *Montgomery:* Wilted by hot sunshine when setting the vines.

WISCONSIN.—*Crawford:* Late plantings injured by frost. *Walworth:* Unexpectedly large yield and good quality. *Ozaukee:* Late potatoes a failure through drought; early plantings a success, especially Early Rose. *Clarke:* Late plantings destroyed by cold, wet weather. *Dunn:* Partial failure through drought and chinch-bugs. *Douglass:* Injured by frost both in quantity and in quality. *Richland:* Half a crop. *Vernon:* Injured by drought.

MINNESOTA.—*Ramsey:* Neglected crops used up by bugs. *Blue Earth:* Badly injured by drought. *Nicollet:* Crop light; bugs more numerous than ever before. *Redwood:* Late potatoes a failure through drought and early frost. *Blue Earth:* Ruined by drought.

IOWA.—*Cass:* Shortened by drought nearly 40 per cent. *Calhoun:* Small and few. *Harrison:* Reduced plantings; shortened by grasshoppers and drought; crop nothing to compare with last year's fine yield. *Marion:* Failed through drought. *Union:* Shortened by extreme drought. *Iowa:* Injured by frost. *Muscatine:* Drought and bugs have greatly reduced the crop; most of those gathered are very small, except Early Rose. *Jefferson:* Ruined by drought. *Scott:* Shortened by drought. *Marshall:* Short but good. *Taylor:* Almost a failure through drought. *Mitchell:* Excellent. *Monona:* Many fields entirely failed; having planted 700 acres I am buying my potatoes.

MISSOURI.—*Adair:* Late plantings not half a crop; shortened by drought. *Worth:* Reduced by drought to a half crop; quality good. *Daviess:* All late plantings injured by drought. *Pulaski:* Injured by drought. *Grundy:* Scarce. *Shelby:* Early plantings fair; late ones scarcely any yield.

KANSAS.—*Labette:* Shortened by drought. *Bourbon:* May be half a crop. *Clay:* Damaged by drought. *Kansas:* Very scarce through drought. *Montgomery:* Light, unless the autumn be favorable. *Coffey:* Shortened by drought. *Cherokee:* Improved by late rains. *Cowley:* Moderate. *Douglas:* Early Rose did well; later varieties short. *Reno:* Early potatoes good; late ones scarcely worth digging. *Washington:* Reduced by drought and bugs to a fifth of a crop. *Shawnee:* Drought left but few potatoes.

NEBRASKA.—*Madison:* Colorado-beetles have been very destructive; cut down the crop one-half. *Nemaha:* Nearer a failure than ever before. *Gage:* Late potatoes will not return much more than their seed.

NEVADA.—*Esmeralda:* No frost yet to kill potato-vines; season favorable.

SWEET POTATOES.

The average condition of this crop is in, Virginia, 101; South Carolina, 102; Georgia and Alabama, 104; Florida, 110; Texas, 117; West Virginia, 100; in the remaining States which grow the crop (except Pennsylvania, 103, in which it is grown on a limited scale) the condition is below average, the range being between 99 in Mississippi and Arkansas and 79 in Illinois.

BEANS.

This crop was in average condition or above in Vermont, Massachusetts, Pennsylvania, Virginia, South Carolina, Alabama, Arkansas, West Virginia, and Oregon. In all the other States it was below average; the minimum, 81, is reported in Iowa.

PEASE.

The acreage of this crop, compared with last year, was increased 1 per cent. in Indiana and Wisconsin, 2 per cent. in California, 3 per cent. in Virginia and Oregon, 4 per cent. in Georgia and Arkansas, 5 per cent. in South Carolina, 6 per cent. in Louisiana, 9 per cent. in Alabama, 10 per cent. in Delaware, and 14 per cent. in Texas. In West Virginia and Iowa the acreage was equal to last year. All the other States show a decrease, the greatest ratio, 15 per cent., being shown in Florida and Kansas. The condition of the crop was average or above in Vermont, Pennsylvania, Delaware, South Carolina, Georgia, Alabama, Louisiana, Texas, Arkansas, Michigan, Indiana, and Wisconsin. All the other States were below average, the lowest being Missouri, 88.

SORGHUM.

Sorghum was 3 per cent. above average in Texas, and 5 per cent. in Georgia. In all the other States it was below, ranging down to 81 in Missouri. No returns of this crop were received from the New England States, New York, New Jersey, South Carolina, Florida, Louisiana, Wisconsin, California, and Oregon. At several points in the Northwest its culture and manufacture were reported as declining. In some of the northwestern counties the crop was injured by frost.

COTTON.

The average condition of cotton in the first week of October, as compared with October reports of 1871 and 1872, stands as much higher than that of the former year as it falls below the records of the latter. The standard crop being a good normal growth, the yearly losses from worms or other casualties almost always reduce the record below 100, and the greatest reduction usually occurs in September. The average this year has fallen off from 89 to 78½ since the first week of September; a larger reduction than usually occurs. The general average in October of 1871 was 76; it was 82 in October of last year. The area was one-eighth greater in 1872, and the autumn more favorable for development and picking, and the result an increase of about one million bales. The area of the present year was increased about 10 per cent., but a portion of this enlargement was abandoned, and the October status of the crop is materially reduced. The season must be of average length, and comparatively favorable for picking, to insure a crop equal to that of last year.

The following figures represent the condition of cotton, as reported in October of the last three seasons:

	1871.	1872.	1873.
North Carolina	80	90	88
South Carolina	75	86	80
Georgia	72	88	82
Florida	73	75	76

	1871	1872.	1873.
Alabama	75	82	78
Mississippi	76	78	75
Louisiana	73	72	72
Texas	70	85	80
Arkansas	82	75	83
Tennessee	94	90	90

The month of September witnessed several storms of rain in the South Atlantic States, which injured the plants, beat out and stained the fiber, and retarded the picking. A storm on the 19th of September proved particularly disastrous in Florida and in parts of adjacent States. Worms have continued their ravages and made advances upon new territory in Arkansas and North Carolina. Several counties in the latter State report the presence of caterpillars for the first time. There is a general complaint that the plants are already bare of leaves, and that picking will be completed at an early date. In some counties of the Gulf States it is claimed that there will be an average crop, notwithstanding the caterpillar and boll-worm, while in other counties a loss of one-third of the crop from worms is expected.

VIRGINIA.—*Prince George:* Late planted and injured by caterpillars; cotton-culture is superseding pea-nut culture. *Southampton:* Excessive rains have caused a large growth of weeds, with but few bolls; leaves stripped by caterpillars. *Princess Ann:* Worms in the crop.

NORTH CAROLINA.—*Gaston:* Fair average if frost delays till October 20. *Chowan:* Heavy rains have greatly injured the crop; army-worms in many fields have destroyed the leaves and later bolls; never had cotton-worms here before. *Sampson:* A partial failure through excessive rains and caterpillars; very few leaves left, and young bolls now in process of destruction. *Lenoir:* Three-fourths of a crop; worms appeared August 15, and have been destructive. *Beaufort:* Seriously injured by excessive rains; caterpillar appeared for the first time, and was very destructive. *Pitt:* Considerably damaged by worms. *Currituck:* Ruined by army-worms; fields stripped bare, and the promised yield cut down at least one-third. *Wake:* Financial panic interferes with the picking. *Carteret:* Worse injured by army-worms than ever before; late plantings but half a crop. *Martin:* Late crop taken by caterpillars, which stripped the leaves and ate many bolls. This is entirely new here. *Perquimons:* Reduced to a half-crop by rain and army-worms. *Bladen:* Injured by rust and army-worms; some estimate the crop at one-half average. *Cumberland:* Damaged 33 per cent. by excessive rains; rainy picking-season. *Jones:* Shortened by heavy rains in August, and worms in September. *Anson:* A failure through excessive wet. *Greene:* Smaller crop than ever known; leaves stripped by worms. *Stanley:* Worms in cotton in parts of the county where it was never before known, but too late to do damage.

SOUTH CAROLINA.—*Chester:* Twenty-five per cent. below last year; injured by frequent rains. *Greenville:* Peeler has grown from 3 to 6 feet high; as many as 90 blooms on one stalk; probably 12 bolls per stalk will mature before frost; 5 is considered a good average here. *Richland:* Young cotton largely destroyed by caterpillars, and old cotton very much injured; excessive rains have filled the field with grass. There was no August crop, only July fruit maturing. *Clarendon:* Rains in August and September rusted the crop disastrously, in some localities, considerably reducing the general average. *Newberry:* Injured by rust and caterpillars. *Chesterfield:* The crop has fallen off 10 per cent. through rains, caterpillars, and boll-worms; some whole crops ruined by the latter. *Williamsburgh:* Ruined by rust, caterpillars, and boll-rot; being open, it has been largely stained by rains. *Orangeburgh:* Worms swept the crop as effectually as a frost; appeared September 15. *Lexington:* Suffered from long heavy rains, and from army-worms. *Union:* September favorable to cotton; crop average, but about one-sixth under last year's. *Laurens:* One-third below average, through rain, rust, and worms; leaves stripped. *Fairfield:* Damaged by heavy rains and caterpillars; no clean cotton yet saved. *Edgefield:* Growth stopped by caterpillars, rust, &c.; bolls opening fast; fine picking-season.

GEORGIA.—*Gordon:* Opening well; yield large; lint fine; season dry. *Upson:* Boll-worms injurious, especially on low lands, where the growth was rank and heavy; caterpillars appeared later, and scarcely a field has escaped their ravages. *McDuffie:* Shortened 20 per cent. by rain, rust, boll-worms, and caterpillars. *Worth:* Shortened a third by caterpillars. *Muscogee:* Caterpillars have stripped the leaves and destroyed the top crop as well as a portion of the middle crop. *Madison:* Top crop badly shed owing to wet, rust, and army-worms. *Lincoln:* Greatly damaged by rain-storms and

ravages of caterpillars; yield one-third below last year. *Dooly:* Badly damaged by caterpillars and rust. *Columbia:* Very short; little or no August crop; injured by heavy rains. *Hart:* Possibly one-half short. *Carroll:* Badly damaged by drought and caterpillars. *Sumter:* Cut short by caterpillars. *Marion:* Cotton will not mature in its present condition as the leaves are all off and worms are now eating the bolls. *Liberty:* Scarcely a green cotton-leaf remains. The crop was also injured by the great storm, September 19. *Lee:* Since last report the crop has been injured at least 20 per cent. by worms; it has also suffered from recent heavy rains. *Clinch:* Caterpillars cut down the crop one-half. *Walton:* Materially injured by drought. *Butts:* Promises a full average in spite of boll-worms and caterpillars. *Douglass:* Bolls prematurely opened and spoiled by rains; the stalks being low and the bolls near the ground, the cotton is depreciated 1 to 1¼ cents per pound. Derangement in money matters will bring low prices, which will greatly embarrass farmers. *Gwinnett:* Leaves stripped by army-worms; late bolls injured somewhat. Peeler cotton good though a little late; finer texture than common varieties, and worth a cent and a quarter more to the pound. *Richmond:* Caterpillars have destroyed the August cotton in most of the county. *Schley:* Swept by caterpillars. *Twiggs:* Swept by boll-worms and caterpillars. *Baldwin:* All the fruit from the blossoms of the last week of August and the first two weeks of September destroyed by caterpillars and boll-worms. *Calhoun:* Cut down 30 per cent. by caterpillars and wet weather; the remnant will be greater than last year's yield. *Heard:* Unprecedented destruction by caterpillars and boll-worms. *Wilkinson:* Ruined by rust and caterpillars. *Wilkes:* Caterpillars very destructive; have stripped the leaves. *Jackson:* Not over two-thirds of a crop in spite of enormous quantities of guano; caterpillars destructive. *Merriwether:* Picking-season favorable. *Whitfield:* Good. *Spalding:* Excessive weed; poorly fruited; injured by worms. *Macon:* Injured by the heavy storm of September 19; picking-season very favorable; crop probably 25 per cent. below average. *Coweta:* Stripped by caterpillars; opening slowly. *Decatur:* Injured by heavy storm, September 19; crops scattered and cotton-gins demolished. *Brooks:* Great injury from the storm of September 19. *Franklin:* Considerably shortened by worms.

Florida.—*Taylor:* Late cotton cleaned out by the caterpillar. *Leon:* A fourth of the crop destroyed by the great storm of September 19. *Wakulla:* Shortened possibly one-half by the equinoctial gale. *Suwannee:* Injured by caterpillars; Peeler upland the poorest ever tried here. *Columbia:* Much injured by rust and caterpillars. *Gadsden:* Immense destruction of cotton by the storm of September 19; cotton all open, and especially liable to injury. *Hamilton:* Seriously injured by storm and caterpillars. *Orange:* Excessive rains prevented a good fruitage; crop small. *Levy:* Prospect much improved; good picking-season; staple better than usual. The great storm did not reach east of township 17, range 17.

Alabama.—*Greene:* No top crop; small middle and bottom crops; eaten by boll-worms and caterpillars. *Chambers:* Would have been average but for caterpillars. *Montgomery:* Weed late, and worms early; crop figures greatly depressed in consequence. *Jackson:* First crop good; later pickings not so good; opening too rapidly through drought. *Bibb:* At least a third destroyed by caterpillars. *Clarke:* Full average in spite of worms. *Saint Clair:* Peeler cotton promises 500 pounds per acre. *Hale:* Poorest crop for thirty-five years; destroyed by boll-worm and caterpillars, mainly the latter. *Geneva:* All that could be reasonably desired, though both boll and leaf worms did some little damage. *Calhoun:* Badly damaged by worms; worse than last year. *Franklin:* Picking-season opened well; many say they are getting two-thirds of the yield at the first picking; light frost September 15, but no damage; top crop out of danger, but the picking is interrupted by rains; last year's crop all of low grade. *Winston:* Opening freely, with fine picking weather; crop better than was expected. *Conecuh:* Twenty-five per cent. short of last year's crop. *Randolph:* July crop good, but that of August and September almost a failure; worms destroyed squares and half-grown bolls. *Morgan:* Fine picking-weather; quality good. *Crenshaw:* Equal to last year.

Mississippi.—*Tishemingo:* Not so good as usual; good picking-season. *Lee:* Boll and leaf worms on low, rich lands reduced the general average to 60. *Grenada:* Most of the crop will be picked by November 10—a very unusual fact; yield 20 or 25 per cent. less than last year. *Warren:* Damaged 20 per cent. since September 1, by worms and boll-rot. *Pike:* Curtailed by boll-worm, rust, and caterpillar. *Wilkinson:* Great destruction by boll-worms and other insects, as well as by rot from constant wet weather. *Rankin:* Nearly all open and the cotton falling out; deterioration of 20 per cent. in the last month, through drought and caterpillars. *Attala:* Short crop. *Claiborne:* Late cotton ruined by worms. *Clarke:* September favorable for picking; worms, in many places, destroyed the top crop. *Jasper:* Worms injured the crop in the last week of August, causing it to open prematurely; picking late; quality poor. *Leflore:* Fallen off 20 per cent., from worms and shedding of forms and blooms. *Madison:* Depreciated greatly in two months, from worms, shedding, &c. *Noxubee:* Spotted; tolerable crop in some places; in others almost a failure. *Winston:* Lately injured by worms.

Holmes: Injured by worms and wet weather. *Washington:* Leaves stripped by worms, and hence cotton opens faster than it can be picked. *Yalabusha:* Top crop shed, through drought, to a considerable extent; bottom and middle crop will mature before frost. *Lowndes:* Failure of this crop will put it out of the power of many to raise another; what will be saved from the wreck will cost 30 cents a pound.

LOUISIANA.—*Claiborne:* Crops swept by worms, especially late ones. *Washington:* Average in spite of worms; picking will be finished before November; crop equal to last year's. *Franklin:* Promising up to September 1; stripped by worms, since, of everything except full-grown bolls. *Morehouse:* Opening very fast in the dry weather; boll-worms very bad. *East Baton Rouge:* The dreaded cotton worm has come, and has reduced the prospective yield 10 per cent. since last report: nothing left for the frost; remains of the crop will be gathered within a month. *Rapides:* Weather not favorable for opening green bolls; cotton necessarily poor. *West Feliciana:* Stripped by caterpillars; crop but one-third of last year's. *Tuscaloosa:* From half to two-thirds of a crop; an early and persistent use of Paris green and arsenic secured good crops. *Madison:* Entirely stripped of leaves and small bolls; fine picking season. *Caddo:* Opening fast; half picked already. *Bossier:* Greatly injured by boll-worms and caterpillars. *Concordia:* Injured by rot and worms. *Tensas:* Stripped by worms in the first week of September; this injured later cotton, while the earlier suffered from rot.

TEXAS.—*Navarro:* Weather favorable for picking. *Henderson:* Shortened one-fourth by worms. *Collin:* No worms; picking progressing rapidly in the fine weather. *Liberty:* Better than was expected; worms unaccountably disappeared; crop quite grassy. *Austin:* Latest crops within memory of the oldest inhabitants; about half average. *Nacogdoches:* Almost entirely destroyed by caterpillars. *Columbia:* Since September 1 caterpillars have stripped cotton foliage, and eaten a large number of young bolls. *Cooke:* Cotton stood the drought very well. *Dallas:* Prospect good for a yield above average; 300 pounds of lint per acre; the most of the crop will class as good middling. *Fayette:* River lands a half crop; uplands a quarter crop. *Fannin:* Crop light; staple good. *Matagorda:* Almost a failure; one-tenth of a bale per acre. *Titus:* Cut down 20 per cent. by boll-worms. *Washington:* Weather fine for picking what was left by the worms. *Marion:* Materially injured by worms. *Red River:* Crop light; worms injurious. *Rusk:* Stripped of leaves by worms: boll-worms ate all the young bolls of August; Peeler seed good. *Wood:* Favorable for picking. *Williamson:* Will be 150 if frosts delay; freedmen picking better than since the war; commands 13 and 14 cents, specie. *Waller:* Devastated by worms; yield a bale to 10 acres. *Upshur:* Shortened by late season, boll-worms, and caterpillars. *Shelby:* Shortened one-half by boll-worms and caterpillars. *Medina:* Damaged by floods. *Laracca:* Crops injured by worms have come out wonderfully in the late fine weather. *Cherokee:* Injured by boll-worms, caterpillars, and different kinds of spear-worms. *Ellis:* Late, but will be average, if good weather continues. *Fort Bend:* Last year we shipped 7,000 bales; this year we will ship but 400.

ARKANSAS.—*Union:* Not over 150 pounds of seed cotton per acre for late crops; reduced by worms and drought within thirty days. *Sebastian:* Shortened by drought fully a third. *Independence:* Something over half a crop; average quality. *Yell:* Opening well; first picking injured by rain. *Crittenden:* Top crop shedding; yield reduced below average. *Arkansas:* Burnt out on uplands; top crop all gone; yield about equal to last year's. *Montgomery:* Runs to weed, and does not boll well; too much rain for heavy soils; will be average on sandy soils. *Fulton:* Many fields ruined by black rust. *Sharp:* Injured by rust.

TENNESSEE.—*Gibson:* Twenty per cent. less in quantity and 20 per cent. better in quality than last year's crop. *Fayette:* Short one-third; August bolls destroyed by drought; leaves discolored and dropping off as if frost-bitten. *Madison:* Very short, through drought. *Dyer:* Staple clean and fine, but shortened by drought one-fourth. *Dickson:* Troubled with worms, but of good quality. *Giles:* Opening unusually fast. *Clark:* Injured by drought, boll-worms, and caterpillars. *Obion:* Prospects good. *Hancock:* Upland cotton from the Department is full of large bolls, with lint longer than usual, but opening a little later. *Hayward:* Shortened a third by drought; top crop a failure.

KANSAS.—*Labette:* Fair and promising; 400 acres planted; picking commenced August 25.

TOBACCO.

The month of September appears to have been, on the whole, favorable to the maturity of the crop in the New England, Middle, and South Atlantic States, all of which, except Georgia, show increased averages. At one or two points in New England the frost more or less injured the crop. The lateness of planting caused considerable apprehensions

of similar results in several counties of Virginia, but no actual injuries had been experienced. Of the Gulf States, Alabama presents an improvement and Texas a decline. An experimental planting of Connecticut tobacco was found successful in Morehouse Parish, Louisiana. The crop remains about the same as last month in Arkansas; in Tennessee it exhibits a depressed average, drought and worms being alleged as the causes in several counties. In West Virginia and Kentucky, in spite of frosts in some counties, and excessive rains in others, the general condition and prospects of the crop have advanced. But little change is noted north of the Ohio River; grasshoppers injured the crop in Medina County, Ohio. West of the Mississippi, Missouri increases her average 7 per cent., notwithstanding late planting, drought, and frost reported in a few counties. Kansas reports about the same condition as at the close of August.

MASSACHUSETTS.—*Franklin:* A few patches injured by frost, but the crop mostly housed in good condition.

CONNECTICUT.—*New London:* Superior crop. *Hartford:* Hail storm of September 1, and frost September 15, cut off a quarter of the crop,

MARYLAND.—*Saint Mary's:* Crops planted in time have grown well generally; in some parts of the county not a third of a crop was planted. *Howard:* Late planted, hence a large portion is still exposed to frost.

VIRGINIA.—*Lunenburg:* September very favorable for tobacco. *Powhatan:* Splendid condition. *Spottsylvania:* Late but large growth; if frost delays till October 10 the crop will be the largest made since the war. *Nelson:* Crop late and poor; in danger of frost. *Halifax:* Improving, but late and threatened by early frosts. *Orange:* Recent rains and warm weather have brought the crop to about an average; another week will mature the late plantings. *Mecklenburgh:* Very late; but little cut as yet. *Henry:* Crop two weeks late, but with the present good weather two weeks longer the crop will be average.

NORTH CAROLINA.—*Forsyth:* Looks well. *Rockingham:* Crop as large as last year, but inferior in quality. *Person:* Improved beyond all expectation by the fall rains; heavy yield.

LOUISIANA.—*Morehouse:* An experimental planting of Connecticut tobacco successful.

TENNESSEE.—*Dyer:* Damaged 50 per cent. by drought. *Smith:* Largest crop for many years. *Montgomery:* Worms have made "spare-ribs and back-bones" of the crop. *Obion:* Pretty good. *Macon:* Late; no frosts yet.

WEST VIRGINIA.—*Mercer:* Exceeds any former crop. *Grant:* Largely frost bitten.

KENTUCKY.—*Daviess:* Acreage 25 per cent. greater than last year, but the crop was largely injured by excessive rains; yield probably from nine to ten million pounds. *Metcalf:* Crop tolerable; most of it still out in the rain. *Russell:* Late; threatened by frost; yield from 25 to 50 per cent. more than last year. *Warren:* Fine; leaves of extraordinary size. *Logan:* Badly injured by worms and delayed till endangered by frost; vegetation has imperfectly matured this season generally. *McLean:* Shortened 10 per cent. by drought. *Ohio:* Season unfavorable for maturing the plants, but favorable for harvesting.

OHIO.—*Medina:* Greatly injured by grasshoppers.

MISSOURI.—*Pulaski:* Injured by drought. *Dallas:* Seriously infected with worms. *Carroll:* Damaged by frost September 18. *Shelby:* Late, light, and badly frosted. *Linn:* Late crops frosted.

SUGAR-CANE.

The six Gulf States report a considerable growth of sugar-cane, as follows: Georgia, nineteen counties, averaging 108; Florida, seventeen counties, averaging 82; Alabama, five counties, 126; Mississippi, four counties, 102; Louisiana, twelve parishes, 97; Texas, thirteen counties, 96. The following supplementary notes will give some idea of the local character of the crops:

GEORGIA.—*Cobb:* As fine as ever was grown. *Jefferson:* Unusually fine. *Brooks:* Great injury from the storm of September 19.

FLORIDA.—*Columbia:* Damaged 20 per cent. by the storm of September 19. *Jackson:* Maturing finely.

ALABAMA.—*Geneva:* Fine. *Crenshaw:* Above average.

LOUISIANA.—*Terrebonne:* Plant cane good; stubble cane very poor. *Rapides:* Plant cane a fair average; stubble a failure.

TEXAS.—*Titus:* Promises a heavy yield, but facilities for manufacture are limited.

FATTENING CATTLE.

The number of fattening cattle is equal to or greater than last year's report in Vermont, Connecticut, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Indiana, Wisconsin, Minnesota, Iowa, Kansas, Nebraska, and Oregon. All the other States show a decrease. Average number, 91 per cent.; average condition, 97 per cent.

The following notes show the condition of fall pastures in different States:

MAINE.—*York:* Pastures unusually good; extra growth of live stock will balance the loss in grain.

NEW HAMPSHIRE.—*Cheshire:* Continuous rains have brought out a heavy second growth of grass; grazing facilities extra.

CONNECTICUT.—*New London:* Fall feed better than for many years.

NEW YORK.—*Yates:* Pasture better than usual. *Warren:* Pastures and meadows seldom better; hay crop short. *Genesee:* Fall feed abundant. *Schoharie:* Second crop of clover hay better than the first; pastures fresh and good. *Rockland:* Aftermath heavy, helping out the short hay crop. *Columbia:* Fall pastures good. *Ontario:* Fall feed good.

NEW JERSEY.—*Sussex:* Excellent fall pastures.

PENNSYLVANIA.—*Cambria:* Hay good; second crop very good. *York:* Weather fine for a large second hay-crop and for abundant pasture. *Crawford:* Drought injured hay and pastures, but the latter is reviving under the late rains.

MARYLAND.—*Baltimore:* Fall pastures never better. *Cecil:* Fall pastures greatly improved.

VIRGINIA.—*Spottsylvania:* Large hay-crop; pastures very fine. *Nelson:* Pastures greatly enriched by August rains. *Halifax:* Fall pastures fine.

SOUTH CAROLINA.—*Greenville:* We have cut three crops of hay from fields manured with barn-yard. *Richland:* Pasturage good. *Orangeburg:* Kentucky blue-grass a failure. *Lexington:* Italian rye-grass and Kentucky blue-grass experiments failed.

GEORGIA.—*Jefferson:* Rains have impeded hay harvest; crab-grass exceedingly abundant; it is the cheapest crop that can be raised, yet it is much neglected.

FLORIDA.—*Santa Rosa:* Last cutting of hay large and valuable, owing to the moisture of the growing season.

TEXAS.—*Austin:* Prairie pasture better than for many years, and hence cattle are in unusually fine condition. *Harris:* Rains have brought out grass-crops finely; hay in great abundance, and cattle are in better order than for years.

ARKANSAS.—*Arkansas:* Pasture drying up. *Fulton:* Prairie-grass remarkably good, remaining green longer than usual.

TENNESSEE.—*Jackson:* Italian rye-grass probably a failure on account of late sowing. *Bradley:* Young clover injured by grasshoppers. *Grainger:* Pastures very good. *Montgomery:* Pastures given out. *Medina:* Pastures splendid, and cattle consequently in excellent condition.

WEST VIRGINIA.—*Grant:* Fall feed plenty. *Marion:* Fall pastures good. *Pendleton:* Pastures injured by drought. *Monongahela:* Fine growth of grass during the latter part of summer, which will make up, in part, for the short hay-crop.

KENTUCKY.—*Jefferson:* Fall pastures greatly improved by late rains. *Shelby:* Grass-crops shortened by drought. *Metcalf:* Pastures shorter than ever known. *Spencer:* Pastures dried up. *Miner:* Pastures injured by drought.

OHIO.—*Crawford:* Grasshoppers nearly ruined clover.

MICHIGAN.—*Hillsdale:* Fall feed good; fine fall rains. *Newaygo:* Fall pasture growing finely. *Mecosta:* Fall feed good.

INDIANA.—*Brown:* Fall pastures dried up. *Orange:* Pastures reviving. *Marion:* Fall pastures very poor. *Martin:* Pastures dried up; cattle falling in flesh. *Warren:* Fall pasture good. *Shelby:* Pastures failing from drought. *Jennings:* Pastures nearly dried up.

ILLINOIS.—*Winnebago:* Pastures bare; little or no grass in the meadows; many are feeding stock already. *Bureau:* Pastures short; cattle are already being fed on soft corn. *Carroll:* Late rains have partially restored the dry pastures. *Kankakee:* After-feed scarce; cattle thin. *Piatt:* Fall pasture getting good. *Knox:* Pastures short.

WISCONSIN.—*Jackson:* Grass very short and poor, but improving. *Green Lake:* Pas-

tures improved by recent showers. *Green:* Pastures shortened by drought; wells lower than for twenty years.

MINNESOTA.—*Le Sueur:* Hay secured in fine order.

IOWA.—*Tama:* Pastures poor and cattle in poorer condition than last fall. *Clinton:* Grass started by late rains. *Union:* Grass-crops shortened by extreme drought. *Floyd:* Fall pasture poor. *Carroll:* Prairie-grass did well.

MISSOURI.—*Platte:* No rain since July 9, hence pastures are dried up and stock poor. *Greene:* Late fine rains have made pasturage good. *Clay:* Fall pastures reviving with late rains. *Harrison:* Fall pastures good and stock doing well. *Cole:* Rains have started blue-grass again. *Grundy:* Pastures poor. *Pettis:* Fall range ruined by grasshoppers.

KANSAS.—*Wabaunsee:* Range pasture good.

CALIFORNIA.—*Del Norte:* Pasturage in better condition than for three years.

UTAH.—*Kane:* Rains have started winter-grass finely. *Tooele:* Pastures good; fine rains of late.

Table showing the condition of the crops, &c., on the 1st day of October, 1873.

States.	WHEAT.		RYE.		OATS.		BARLEY.		BUCK-WHEAT.	CORN.	POTATOES, (Solanum tuberosum.)	POTATOES, (Batatas edulis,) SWEET.
	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Product compared with last year.	Average quality compared with last year.	Average condition October 1.	Average condition October 1.	Average condition October 1.	Average condition October 1.
Maine	75	96	85	100	75	94	78	91	79	85	98	
New Hampshire	93	98	92	99	89	94	83	97	100	99	98	
Vermont	102	106	97	101	102	102	97	98	100	97	108	
Massachusetts	84	102	105	100	93	99	94	95	95	97	105	
Rhode Island												
Connecticut	107	103	104	102	77	83	100	87	87	89	104	102
New York	91	106	99	100	88	97	86	98	97	89	107	
New Jersey	116	102	107	100	89	96			106	99	101	94
Pennsylvania	134	111	107	103	99	100	88	95	99	93	100	103
Delaware	98	105			117	117			105	76	68	60
Maryland	124	109	108	100	109	101			103	91	94	90
Virginia	86	94	91	100	120	111			102	99	101	101
North Carolina	73	90	70	96	100	104			92	95	90	97
South Carolina	79	81	90	90	112	112				89	104	102
Georgia	70	84	86	94	117	109	93	96	100	102	98	104
Florida			103	100	94	99				101	90	110
Alabama	80	80	93	95	117	107			97	92	110	104
Mississippi	85	94	96	97	107	103				86	99	99
Louisiana										92	95	94
Texas	102	95	94	101	120	109			98	78	109	117
Arkansas	112	96	102	97	112	105			100	100	93	99
Tennessee	72	84	92	95	110	101			89	91	93	102
West Virginia	98	95	94	98	118	102	106	103	102	96	95	100
Kentucky	92	88	85	92	104	98	81	100	97	94	90	97
Ohio	102	103	97	100	84	93	90	95	98	88	89	93
Michigan	82	101	96	108	96	101	93	102	78	88	89	91
Indiana	88	94	97	98	81	94	94	97	82	84	77	92
Illinois	106	101	84	97	82	97	81	92	70	67	59	79
Wisconsin	118	107	94	101	104	101	98	101	71	88	95	
Minnesota	120	110	96	102	100	103	72	97	98	97	90	
Iowa	112	108	97	102	96	99	79	88	64	81	51	81
Missouri	149	101	101	99	93	98	105	100	65	76	61	80
Kansas	139	107	136	102	105	101	106	95	71	66	58	83
Nebraska	120	104	106	99	80	99	95	98	74	77	56	87
California	84	100	99	100	97	101	91	100		100	105	96
Oregon	129	104	114	105	123	105	119	103	100	100	105	

Table showing the condition of the crops, &c., on the 1st day of October, 1873—Continued.

States.	TOBACCO.	BEANS.	PEAS.		SORGHUM.	SUGAR-CANE, (not sorghum.)	COTTON.	OLD WHEAT.	FATTENING CATTLE.	
	Average condition October 1.	Average condition October 1.	Average compared with last year.	Average condition October 1.	Average condition October 1.	Average condition October 1.	Average condition October 1.	Average am't of, in your county, compared with last year. (Answer in *hundredths* as with other questions.)	Average no. of, compared with last year. (Answer in *hundredths* as with other questions.)	Average condition October 1, compared with last year.
Maine		92	95	96				100	93	99
New Hampshire	112	93	92	97				100	99	104
Vermont		100	96	100				96	100	97
Massachusetts	105	100	95	95					96	99
Rhode Island										
Connecticut	96							100	105	107
New York	101	98	96	96				75	93	101
New Jersey		95						94	99	104
Pennsylvania	88	100	98	100	88			84	100	102
Delaware		90	110	100	90			90	100	105
Maryland	77	87	97	90	88			91	100	110
Virginia	85	100	103	99	99		90	82	100	106
North Carolina	99	98	98	96	91		88	86	101	102
South Carolina		100	105	100			70	70	103	105
Georgia	101	99	104	102	105	108	82	84	104	108
Florida			85	96		82	76		102	105
Alabama	111	101	109	108	95	126	78	89	106	106
Mississippi	86	93	97	94	95	102	75	90	90	100
Louisiana	101		106	103		97	65		95	113
Texas	93	96	114	106	103	96	80	117	92	111
Arkansas	101	100	104	100	93		83	89	92	102
Tennessee	97	98	95	93	98		90	86	102	100
West Virginia	100	102	100	99	95			84	99	103
Kentucky	92	91	95	98	99		110	85	97	101
Ohio	93	96	99	98	93			86	99	101
Michigan		95	99	103	88			80	97	98
Indiana	100	97	101	100	87			74	100	96
Illinois	90	87	98	90	83			85	91	97
Wisconsin	78	94	101	100				85	100	99
Minnesota		95	99	97	92			94	100	105
Iowa		84	100	98	83			90	103	95
Missouri	89	84	91	88	84		90	72	93	97
Kansas	95	84	85	96	87			94	111	99
Nebraska		86			92			104	130	98
California		92	102	97				72	91	100
Oregon		109	103	98				61	114	105

EXTRACTS FROM CORRESPONDENCE.

LABOR AND COTTON PRODUCTION.

Dooly, Georgia.—There is a great deficiency in the labor system here. Most of the planters rent their lands to the freedmen, or take them in as "croppers," and in most cases the freedmen are too anxious to "lay by" the cotton-crop entirely too soon. It has been proved that late light plowing is of great advantage to cotton; it has a tendency to keep the plant healthy and in a growing condition; it is also held by some farmers that it is a preventive against rust; but my experience has taught me that it depends upon the condition of the weather and the manner in which the plowing is done. When the land is not too wet, late light plowing is certainly of great advantage to cotton.

There are two kinds of rust, the yellow and the black; the yellow is the most injurious, as it spreads all over the farm, while the black only makes its appearance in spots. I am of the opinion that there is no remedy for either.

Liberty County, Georgia.—The agricultural prospects of Liberty County are improving. The small farmers, who owned but few slaves and were inured to labor before the war, are now getting rich under the improved prices of all produce. The freedmen are also purchasing land and all kinds of stock. The better class of them prefer farming "on their own hook." The refuse can generally only be hired by the day or week. They must be paid on Saturday, and their earnings go for groceries and liquor. Labor is scarce and exacts high wages. The prospect is that common schools among the whites, with separate schools for the negroes, are about to be successfully inaugurated.

FAILURE IN GRASS-SEED.

Oldham, Kentucky.—Our orchard grass-seed crop is not over 40 per cent. of the usual yield. This county makes an average of some 30,000 to 40,000 bushels annually for sale, for which we have been getting from $1.50 to $2 per bushel. This year the crop will not exceed 15,000 bushels; cause of the failure, hard freezing and no snow to cover the ground in January last.

TOBACCO PRODUCT OF DAVIESS COUNTY.

Daviess, Kentucky, August 1, 1873.—The number of pounds of tobacco reported by me, (of the product of 1872,) June 26, 1873, was 11,417,000. The amount since reported as sold in McLean County is 350,000 pounds; reported by purchasers previously overlooked, 360,000 pounds; total raised in Daviess County in 1872, 12,027,000 pounds. I feel confident that the above number is not over the mark, as I have the reports of each purchaser, and may have overlooked some small purchasers. Does any county in the United States beat Daviess County, Kentucky, in the quantity of tobacco raised? Average price, leaf, lugs, and trash, 7½ cents per pound, or $902,025 for the crop.

COAL-ASHES AS A FERTILIZER.

Franklin, Pennsylvania.—I have always believed that coal-ashes had a value for agricultural purposes, and have advocated the free use of them, particularly on limestone soil. This season I determined to get closer to the root of the matter, and test their value fully. I had a plot of ground on which I had been unsuccessful for several years in raising good Early Rose potatoes. The soil was in the best condition always. The tops did well. This spring I had the ground scored about six inches deep, placed the cut potatoes in the bottom, and filled up with coal ashes. The plants grew finely, notwithstanding the dry weather. The tops did not fall over even after the weather changed, and I secured a crop of the very best potatoes for the table I ever raised.

The second experiment was with onion-seed and coal-ashes. I put out five good-sized beds in seed. In four the seed was covered with soil; the fifth I covered with sifted coal-ashes. The result surprised every person that knew of the experiment and watched its progress.

A third experiment was started on seed which promised utter failure to those who looked on; the end has not yet been reached, but I am more than satisfied with the result thus far, and fully satisfied that my experiment will bring me at least $100 more than if left untried. I have abiding faith in coal-ashes and am ready to use all I can purchase.

BUSH CLOVER.

Calhoun, Alabama.—We have in this and adjoining counties a species of wild or bush clover which grows wild on the road-sides, in old waste fields, and even in the woods where there is not much timber. I have just returned from an extensive trip in this county, and find that this season it is very luxuriant everywhere. Stock of all kinds are very fond of it. In uncultivated fields it grows from 10 to 12 inches high; not so high outside where it is exposed to stock all the time, but it becomes almost a perfect mat on the ground. It will eventually, I think, eat out or supersede the native wild grasses. In my opinion it is likely to really prove a great blessing to the country. Sheep and goats, as well as colts, quit the mountains about July, come down into the valleys, old fields, and road-sides, and keep fat on it until late in the fall. As a locality for sheep-husbandry, Calhoun County could not be excelled in the State, if it were not for wolves and dogs.

INCREASED PRODUCTION OF BRITISH FARMS.

"Worn-out soils," and "exhausted lands," are phrases that have no place in the vocabulary of an advanced agriculture. Deterioration is not the legitimate result of culture. When retrograde is the rule in the rate of yield, either a declining agriculture, or a primitive and unorganized one, may be assumed. In all the new States of this country, it has often been stated, the yield of the principal products tends rather to decline than to advance. The assumption is correct. Should this fact be deemed an industrial disgrace, and an indication of the inefficiency and unskillfulness of our farmers? Not necessarily. If we regard pioneer agriculture as only an incident to land speculation—the means by which a poor and farmless man may obtain a title, at a nominal cost, to land that will make either himself or his children rich, as settlement and society perfect the advance from nominal to intrinsic value—it is seen to have a basis of sound sense. If, on the other hand, wasteful and depleting methods are continued, and temporary want of system becomes habitual chaos, a stigma is assuredly placed on such practice, and the result is a disgraceful retrograde, disreputable and ultimately unprofitable. The tendency to a settled habit of shabbiness and wastefulness is so strong that the pioneer is naturally expected to sell out, remove, and open more wild land before the advancing wave of even a somewhat more methodical and scientific agriculture.

If our yield of wheat, for instance, is decreasing slightly, it is not because of the absence of all progressive elements in our agriculture, but from the fact that most of it is grown on new lands, by pioneer farmers, for the temporary purpose of money-making, without regard to a slight deterioration. Nor is the decline in yield wholly or mainly the result of depletion; it is often caused by careless culture, which fails to check the growth of weeds that ultimately overshadow and strangle the crops.

It is well known that Great Britain obtains larger average yields than any other country. A small area and a large resident population have made necessary a high state of culture and increased production. Science has been invoked, English, German, and French experiments have

been tested, capital without stint and business acumen have aided in the effort to obtain larger supplies of bread and meat from a given area.

Where this necessity has not existed, even in the British Colonies, the yield of wheat scarcely exceeds our own average. This is the case in Canada, in the Australian Colonies, and in New Zealand. In Europe the only close competitor with Great Britain in productiveness of the wheat area is Holland, a densely peopled country in which high culture has become the rule. According to the latest official statistics the following are the average rates of yield for the products named in the countries specified:

Countries.	Date of returns.	Wheat.	Barley.	Oats.	Rye.	Maize.
		Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
Sweden	1870	.....	.....	.....	.....	.....
Norway	1870	22.1	30.3	35.7	25.9	.....
Prussia	1867	17.1	25.1	32.9	16.7	.....
Bavaria	1863	16.3	20.1	22.5	16.3	24.9
Wurtemburg	1871	19.3	25.7	28.4	19.4	18.4
Holland	1870	27.1	43.8	43.5	21.3	.....
Belgium	1866	20.3	34.9	41.2	24.6	.....
France	1869	17.1	20.9	25.6	15.5	17.1
Portugal	1865	8.9	11.1	18.6	6.7	20.0
Spain	1857	23.3	24.3	.....	8.4	.....
Austria	1871	15.2	17.0	19.2	14.7	15.1
Greece	1867	13.2	18.8	19.0	.....	17.4

What is the present British average yield of wheat? It is a matter of estimate. A government census of acreage is taken annually, but not of quantity of product. Some estimates make the average 32 bushels. Mr. James Caird, who is probably as good authority as can be cited, makes it 28 bushels. In 1850 he placed it at 26½ bushels. In 1770, Arthur Young, as the result of careful investigation, made the average 23 bushels. Assuming these figures to be correct, as they are deemed to be substantially by men of the best information and judgment, the increase has been 1½ bushels since 1850, and 5 bushels in the last century. This estimate is for Great Britain; the average for Ireland is placed at 24 bushels. The United Kingdom, therefore, makes an average of about 27 bushels. This is, of course, the average of a series of years, as the influence of the seasons causes fluctuations which probably cannot be measured by less than a range of 15 bushels, or from 20 to 35 bushels.

What are the means by which this pre-eminence is attained? Great Britain has a moist climate, less subject to drought than ours, yet the best yield in ten years was in 1868, a season remarkable for its high temperature and continued drought. Much of the area of that country is not adapted to wheat, which is mainly produced along the eastern and southern sea-board, a belt less humid than the northern and western counties, and scarcely extending through three degrees of latitude, in which little more than three millions of acres are cultivated—about the same area as that in wheat the present year in Iowa and Minnesota. The soil is not naturally so superior as to account for the high rate of production, which is mainly due to thorough comminution, manuring, and cultivation of the soil. All heavy soils are first underdrained, deep plowing follows, and then the sub-soil is broken; crops of clover collect ammonia from the atmosphere and form nitrates in the soil; crops of turnips, made plethoric by the use of commercial fertilizers, are eaten from the ground by fattening sheep to furnish the richest immediate manuring for the wheat-crop; and then the wheat is drilled in rows as

straight as an arrow; the horse-hoe, cultivating a breadth wide as that stirred by a common harrow, passes once, sometimes twice, with care and celerity between the drills, gently stirring the soil and uprooting weeds, while gangs of hands subsequently pass through the fields to extirpate the larger remaining weeds, which would otherwise go to seed and reduce future productiveness. Judicious rotation usually comes in to economize in the highest degree and utilize most beneficially the expensive stores of plant-food assimilated by the various crops.

Almost universally commercial fertilizers are used, not as a main dependence in fertilization, but as an adjunct of and complement to the home manures obtained by the feeding of cattle and sheep, and to the various resources of clovering and green-manuring. It is a confidently received opinion that paying productiveness cannot be permanently maintained without the consumption of a considerable proportion of the farm products of domestic animals. This opinion is accredited with a common-sense basis, and has the sanction of long and successful experience; in the case of the farmer of average skill and of traditional practice it is assuredly the only safe rule to follow, as a matter of economy in fertilization; except in peculiar circumstances of soil and situation, where suitable artificial aids are abundant and cheap, it is a theory which should be closely adhered to in practice.

EXCLUSIVE ARTIFICIAL MANURING.—There are examples of bold and, for the time at least, successful practice in depending almost exclusively upon commercial fertilizers to keep up the fertility of the soil, from which all its products are sold and carried off year after year. While in England, the present summer, the writer visited the scene of a remarkable example of this kind, a brief history of which may be profitably unfolded for suggestion and inquiry, if not for imitation.

Mr. John Prout, a London merchant, who had been bred a farmer in England, and had for years of his early life cultivated a farm in Canada, bought in 1861 two old and somewhat dilapidated farms in Hertfordshire, near Sawbridgeworth, about thirty miles northeast from the metropolis. They comprised 460 acres, the soil of which was a clay-loam, which had been worked only three or four inches in depth, was "clover-sick," and so unproductive that it was sold at the low price of £35 per acre. The neighbors were inclined to regard with derision the expectations of the city farmer, and freely prophesied a loss of patience or money, or both, and the abandonment of the effort. His first movement was the destruction of most of the hedge-rows, which divided the land into fifty-one irregular, small, and inconvenient parcels, thus saving, in the space occupied by hedges and ditches, 16 acres, at a cost of £311 for the improvement. A further gain of 2½ acres was made by filling a moat and ponds.

This area was divided into twelve fields. Exchanges of land were effected and lines straightened to economize the work of culture by the use of steam. A thorough system of tile-draining was then constructed, and an open ditch cut at one point to facilitate surface-drainage. These improvements brought the cost of the investment to £50, or $250, per acre. Being now ready for soil preparation, he bought a set of John Fowler & Co.'s steam-plowing tackle, at $6,000, and kept it at work much of the time, in 1862 and 1863, plowing 1,401 acres, sub-soiling 277, and scarifying 480; in all, 2,158 acres in those seasons. Mr. Prout says: "Plow often, plow deep, keep constantly plowing, was my motto for the first few years." The cost of this plowing, in comparison with horse-power, is deemed less than the same depth of pulverization by the old method, though more per acre than the shallow culture formerly practiced. Some

neighbors who doubted the economy of steam were offered a round price, $5 per acre, for similar work, but, after making experiments with an acre or two, declined to proceed even at that price. After the first four years little subsoiling was deemed necessary. The following statement shows the amount and kind of steam-plowing done in eleven years:

Years.	Sub-soiling. Acres.	Plowing. Acres.	Scarifying. Acres.	Total acres.
1862–'63	277	1,401	480	2,158
1864	191	409	264	864
1865	98	496	317	911
1866	.....	310	.....	310
1867	.....	637	174	811
1868	.....	321	257	578
1869	.....	386	116	502
1870	.....	281	277	558
1871	.....	296	130	426
1872	57	304	55	416
Total	.....	.....	.....	7,534

Wishing to avail himself of any possible aid from chemistry, Mr. Prout obtained from Dr. Voelcker analyses of three samples, representing fairly the peculiar constitution of the varieties of soil found on his property. They show no remarkable degree of fertility, although they possess abundance of aluminum and lime, important though common and inexpensive constituents of a good clay soil. An apparent excess of oxide of iron has not materially depressed the rate of yield. The following is the record of the chemist:

	No. 1.	No. 2.	No. 3.
Organic matter	4.75	4.46	5.49
Oxide of iron	4.80	4.29	7.91
Aluminum	5.29	4.90	2.06
Carbonate of lime	2.45	4.74	1.80
Sulphuric acid	.08	.01	.09
Phosphoric acid	.16	.12	.27
Magnesium	1.84	1.59	.80
Potash	.54	.72	.51
Soda	.08	traces.	.16
Insoluble matters	79.91	79.17	80.91
Total	100.00	100.00	100.0$_0$
Saved by washing	53.01	42.64	39.3$_8$

The accompanying plans represent the property as it was originally and as it appears at present. The proprietor furnishes the following explanations:

The parts shaded show the fields that were either exchanged or bought. It may be seen that some were most inconveniently situated. There are still, according to new plan, several pieces that it would be advisable to buy, but they are so tied up that they cannot be sold.

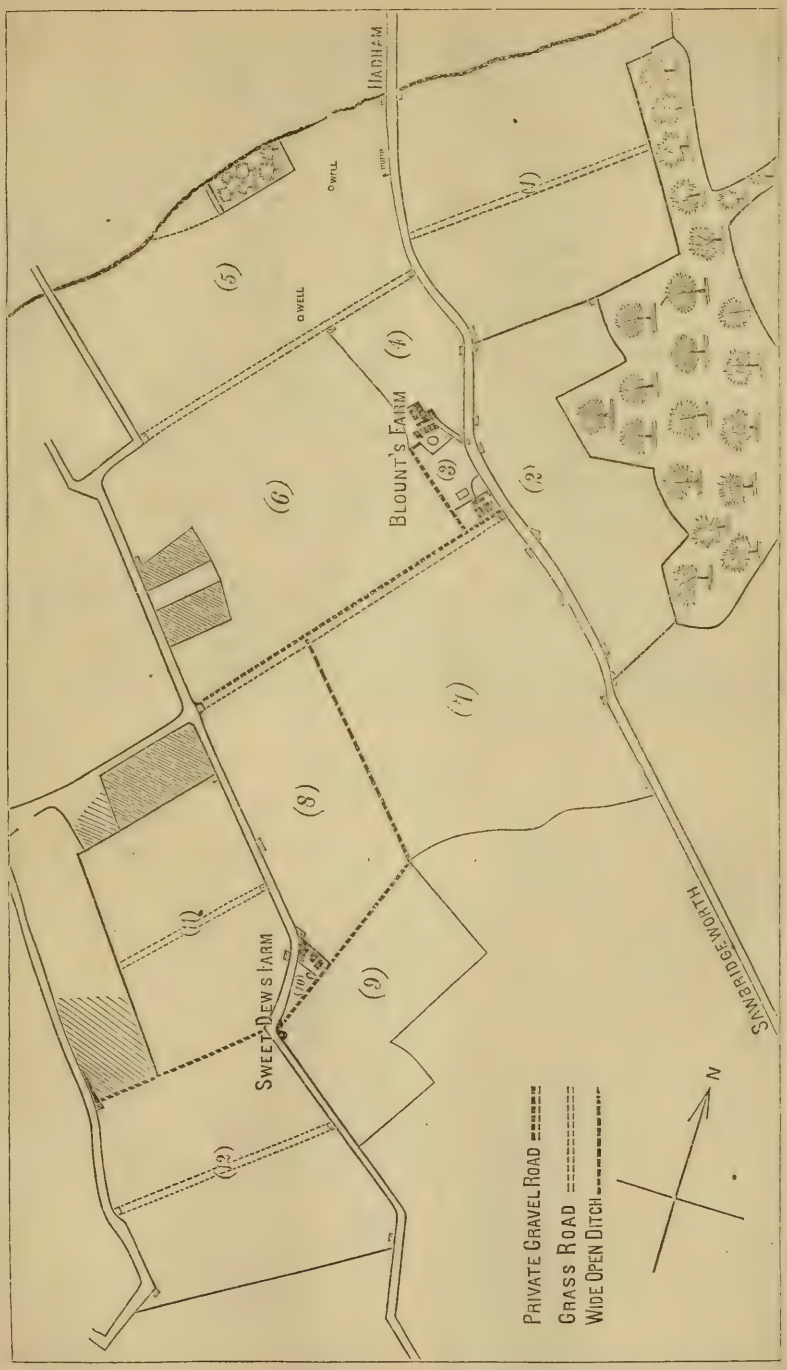
It may be noticed that the course of the public road from Sweet Dews to corner of private gravel-road has been changed and made straight by agreement with the Lord of the Manor, and undertaking to incur a great part of the expense of making the same myself. I gained half an acre of land by the improvement.

The thick dotted line running from Blount's farm-house to southwestern extremity of farm is a wide open ditch receiving the drainage of all fields on that side of farm.

In field No. 5, two wells of large size have been made. The one near the public road takes the water from a natural spring. There is a pump in the road to take this water for engines. The other well receives the drains from the surrounding fields.

There is one private gravel-road of 792 yards in length, marked as indicated on the margin of the plan. The wide open ditch runs alongside of this for some distance. There are four grass roads for the engine, marked as indicated on the margin.

PLAN OF FARMS BEFORE IMPROVEMENT.



PLAN OF ESTATE AS IMPROVED.

This soil not only needed annual supplies of fertilizers, but this innovating system of farming to be inaugurated made requisite an unusual quantity and nice discriminations in kind. He proposed to sell his crops

"by auction as they stood upon the land, the purchaser reaping, carting, and thrashing, and taking away both corn and straw." This practice appears to have been accepted cautiously, and obviously with some doubt as to results. In the first year, 1862, he fattened 68 oxen, but deciding upon making a radical departure, he kept but one cow in 1863; in 1864 all crops were sold from the farm; in 1865 he so far relapsed as to fatten 14 bullocks, but has since utterly discarded horned-stock, as well as sheep and pigs, and reducing his stock of working horses from 10 to 6. The horse-hoeing, both for cultivation and destruction of weeds, which is always done once, sometimes twice, is performed by horse-power. During the era of deepening the soil, from three or four to eight or nine inches, with sub-soiling to fifteen, fertilizers were not applied very liberally. Since that time their annual cost has been 50 shillings, or $12.50 gold per acre for the entire farm area. The varieties used are super-phosphates, ground bone, guano, and nitrates, the two former mainly. The bone is ground very fine and mixed with super-phosphates, the whole mass moistened with water and allowed to remain for several months before using. The cost in detail has been as follows, (discarding fractions:) Purchased from 1861 to 1865 to the value of £640; in 1866, £434; 1867, £529; 1868, £1,473; 1869, £1,282; 1870, £1,551; 1871, £1,030.

As home-fertilizers were discarded, so also, finding wheat the most profitable crop, he ventured to disregard rotation more and more, until now the wheat area is more than 300 acres. He regards less than 40 bushels per acre a poor crop, and claims to have once obtained 65 bushels per acre. That whatever of system or want of system may be shown plainly, the alternation of crops actually practiced is here given in some of the larger fields:

CROSSFIELDS, (1.)

	Acres.		Acres.
1862. Spring-beans	31	Tares and oats	26
1863. Wheat	32	Oats	25
1864. Fallow	57		
1865. Wheat	49	Swedes	8
1866. Barley	57		
1867. Fallow	39	Peas	18
1868. Wheat	57		
1869. Sanfoin	49	Lucerne	8
1870. Sanfoin	49	Lucerne	8
1871. Sanfoin	49	Lucerne	8
1872. Wheat	34	Oats	23
1873. Wheat			

HOMEFIELD, (6.)

	Acres.		Acres.		Acres.
1862. Fallow	43	Potatoes	9		
1863. Wheat	32	Swedes	20		
1864. Barley	53	Tares	3		
1865. Barley	24	Fallow	28	Beans	4
1866. Barley	11	Wheat	45		
1867. Barley	39	Beans	13	Marigold and fallow	4
1868. Barley	12	Wheat	13	Beans	31
1869. Wheat	31	Oats	8	Beans	16
1870. Wheat	47	Barley	8		
1871. Barley	60				
1872. Wheat	60				
1873. Wheat	45				

WHITE MOOR, (7.)

	Acres.		Acres.		Acres.
1862. Oats	39	Seeds	17	Tares	10
1863. Fallow	49	Oats	17		
1864. Wheat	66				
1865. Oats	32	Fallow	28	Tares	6
1866. Wheat	66				
1867. Tares and fallow	33	Barley	33		
1868. Barley	33	Oats	33		
1869. W. beans	8	S. beans	16	Peas	22
1870. Wheat	66				
1871. Clover	33	Barley	33		
1872. Wheat	66				
1873. Wheat	66				

BEADLES, (12.)

	Acres.		Acres.
1862. Oats	32		
1863. Fallow	44		
1864. Wheat	22	Oats	29
1865. Clover	51		
1866. Wheat	51		
1867. Fallow	51		
1868. Wheat	51		
1869. Oats	51		
1870. Beans	46	Barley	5
1871. Wheat	51		
1872. Wheat	51		
1873. Wheat			

The following summary will show what crops have been cultivated and in what proportions, in acres :

Years.	Wheat.	Barley.	Oats.	Beans.	Peas.	Hay.	Roots.	Fallows
1862		5	140	32		67	60	140
1863	137	30	12			18	25	152
1864	147	73	29			14	30	130
1865	72	65	50	54		52	20	131
1866	223	124	60			33	4	
1867	67	93	15	50	18	88	8	105
1868	170	60	66	72		58	4	14
1869	126	30	70	64	22	58	1	55
1870	208	57		102		66	2	
1871	149	93	36	53		68	39	
1872	340		22			12	56	
1873	305							

This increase in the area of wheat and the frequent repetition of the crop of late, is subjecting the capacity of the soil to a severe test, as the proprietor is well aware, which it has so far sustained wonderfully, the yield in 1872, an unfavorable year, being £11 0*s.* 5*d.* per acre. The average proceeds of sales per acre have been as follows, for the principal crops:

Years.	Wheat.	Barley.	Oats.	Winter beans.	Spring beans.	Peas.	All crops.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1864	9 2 11	7 10 8	6 15 9				8 8 0
1866	9 18 11	5 19 11	5 3 9				8 3 5
1868	14 14 2	13 2 10	10 0 0	7 14 8	6 6 8		12 0 2
1869	14 6 8	12 9 2	8 0 8	8 1 0	4 11 3	2 11 4	10 12 6
1870	15 3 10	10 9 3		7 18 9			12 6 6
1871	14 3 2	8 17 6		7 11 9			10 19 3
1872	11 0 5		7 12 2				10 16 0

The average receipts per acre, without any expense for harvesting, during the past six years, after the seed-bed had been deepened and put in proper condition, have ranged from $50 to $60 per acre. The largest yields were in 1868 and 1870, seasons very favorable to wheat production, especially the former. The average annual expenses are thus summed up by the proprietor:

Manual labor	£520	
Use of six horses	180	
Coal for two month's plowing	42	
Oil	5	
Wear and tear of machinery	77	
Depreciation 5 per cent. on £1,065	53	
Interest, 5 per cent. on £1,065	53	
Seed, (a large estimate)	250	
Artificial manures, at 50s. per acre	1,150	
		£2,330
Rent, at £2 per acre	900	
Rates, taxes, and incidentals	220	1,120
Total yearly outlay		£3,450

The total proceeds of 1870 were equivalent to $26,000 in gold, and for a series of years have averaged $23,000, while the net profit, after laying aside $4,500 in lieu of rent, is about $6,000. This is 45 per cent. of the gross returns. The soil is in excellent tilth; its burden of wheat this summer, as seen in June, was uniform and of vigorous growth, and it is quite evident that with judicious cultivation more than average crops may yet be expected in the future. The ultimate result is a subject of conjecture with farmers, but the proprietor has no fears while he continues to obtain, from so little labor, not less than $50 per acre.

This example is given, not to commend the exclusive use of fertilizers, but to show the extraordinary results of deep cultivation, ample fertilization, and clean and thorough culture. There are in this country abundant resources for improvement of the soil without any extensive use of commercial fertilizers. There is required the constant exercise of a discriminating judgment in adapting means to ends. There are soils in so complete comminution and naturally possessing so fine drainage that deep cultivation is unnecessary, upon which frequent and light surface-manuring is indicated. Let our farmers first know intimately the characteristics of their soils, and then apply liberally, though economically, the means of securing large returns from them.

ENTOMOLOGICAL RECORD.

By Townend Glover, Entomologist.

Grape-vine Borers.—Mr. Fred. J. Kron, of Albemarle, North Carolina, in a letter to the Department, complains bitterly of the injury done to all varieties of grape-vines by the grape-vine borer, *Ægeria polistiformis*, described and figured in former reports of the Department, (1854, p. 80, and 1867, p. 72.) Mr. Kron states the insect has destroyed for him one hundred and seven varieties of grapes, derived from the Luxembourg, in Paris, including some five thousand vines; and adds, that there is but one variety that has, so far, defied its ravages, and that is the scuppernong, which flourishes in the midst of the devastation caused by the borer, all around it. Mr. Kron likewise states that he

found a phylloxera on Clinton root, and adds: "The insect has been noticed here for more than thirty years," but he does not complain of its doing much injury.

In connection with this last-named insect, so destructive to the grape-vines of France, Mr. Gaston Bazille, vice-president of the Agricultural Society of Hérault, publishes a remedy for the Phylloxera, which is translated and republished by Mr. Charles V. Riley, in the New York Tribune, as follows:

Three holes are made around the injured or infested vine, varying the depth according to the nature of the soil, but generally 2½ feet. These holes were made in the experiments reported, by means of a pointed iron bar and a heavy maul. A tube, with a funnel attached, is placed in the hole, two ounces of sulphuret of carbon are poured into the tube, which is then closed with a cork. The vapor of the sulphuret of carbon permeates the soil and impregnates all the roots of the vine. The gas engendered (though not the case with the liquid) is not fatal to the vine, but is sure death to the insects. Four ounces of the liquid has been found sufficient for an ordinary vine; but sprinkling on the surface must be carefully avoided, as it is in such a case very injurious to the vine, whereas a pound may be used in the soil without injury to the roots.

INSECT INJURIES.—The regular statistical correspondence of the Department shows very great injuries, especially to the cotton-crop. The potato-crop was considerably affected in the Middle and Northwestern States, and the grain-crops in the West.

Cotton-caterpillar, or army-worm, (*Anomis xylinæ.*)—This insect during the month of September extended its ravages into the more northern of the cotton-raising States. In Virginia it is noticed in two counties, Southampton and Princess Anne. In North Carolina it appeared for the first time in Beaufort, Stanly, and Chowan counties, where its ravages were quite serious. In Pitt it was very injurious to bottom-crops. It appeared as early as August 15 in Lenoir, and a month later in Sampson and Jones. It stripped the plants in Currituck, Perquimans, Bladen, and Stanly. In the last-named it was questioned whether it did any real damage; the stripping of the leaves, it is suggested, only expedited the opening of the bolls.

In South Carolina greater or less injuries are reported in Richland, Newberry, Chesterfield, Williamsburgh, Lexington, Orangeburgh, Laurens, and Edgefield counties. In Georgia they appeared in Upson, McDuffie, Lincoln, Dooly, Carroll, Liberty, Marion, Sampson, Butts, Richmond, Gwinnett, Twiggs, Baldwin, Calhoun, Madison, Wilkinson, Wilkes, Jackson, Coweta, and Whitfield. In Worth it took a third of the crop; in Muscogee the foliage, the top crop, and part of the middle crop were destroyed; in Clinch half the crop was ruined, and in Lee 20 per cent.; in Heard the ravages were worse than was ever before known. Florida reports very severe injuries in Taylor, Columbia, Suwannee, and Hamilton counties. In Alabama slight damage was inflicted in Geneva County, but more severe in Greene, Clarke, Chambers, Bibb, Calhoun, Hale, and Randolph. The caterpillar was mischievous in several counties of Mississippi, viz: Pike, Warren, Wilkinson, Rankin, Claiborne, Clarke, Jasper, Madison, Winston, Washington, and Holmes. In Lee the damages were mostly restricted to low, rich lands; in Leflore the crop was reduced 20 per cent. In Tuscaloosa the pests were effectually resisted by an early and persistent application of poisons. In Louisiana the presence of the worms, with greater or less injuries, is reported in Claiborne, Washington, Franklin, East Baton Rouge, West Feliciana, Concordia, Bossier, and Tensas. In Henderson County, Texas, caterpillars destroyed a fourth of the cotton, the fields being stripped bare of leaves. In Liberty they unaccountably stopped short of the entire destruction of the crop. Destructive visitations are reported in Nacog-

doches, Washington, Marion, Red River, Upshur, Shelby, and Cherokee. In Matagorda it was found that Paris green was successful, but in wet seasons the poison must be applied every time the worm hatches. In Arkansas three counties—Union, Columbia, and Clark—record the presence of these pests.

Boll-worms (*Heliothis armigera*) were very destructive in Chesterfield County, South Carolina, and are reported in Upson, McDuffie, Butts, Twiggs, Baldwin, and Heard Counties, Georgia. In Green and Hale Counties, Alabama, they were very mischievous, with a light visitation in Geneva. In Lee County, Mississippi, they were observed only on low, rich lands; they were troublesome in Pike and Wilkinson. They were very bad in Morehouse and Bossier parishes, Louisiana. In Titus County, Texas, they cut down the crop twenty per cent., and were more or less destructive in Rush, Upshur, Shelby, and Cherokee. They were also heard from in Clark County, Arkansas.

Grasshoppers, (*Caloptenus* sp.)—These insects were destructive in Bandera County, Texas, and in Uvalde, where their ravages were especially noticeable in wheat and oats. In Bradley County, Tennessee, they were bad in corn; in Hancock they destroyed the turnip-crops. They were observed in the growing wheat in Livingston County, Kentucky. In Medina County, Ohio, they injured tobacco; in Geauga and Mahoning, corn and oats; in Crawford they nearly ruined clover. They were abundant in Orange and Hamilton Counties, Indiana, and in Winnebago and Edwards Counties, Illinois. They were destructive on crops generally in Ramsey County, Minnesota, and especially affected Chinese sugar-cane in Martin. Iowa reports them only in Sioux County. In Missouri they shortened the cabbage and turnip crops of Clay County; in Montgomery and Franklin they were destructive in the growing wheat; in Pettis they destroyed fall pastures. They swept the buckwheat-crop in Osage County, Kansas, and were observed in the cereal crops in Smith County, as well as in Weld County, Colorado, and Lewis and Clark County, Montana.

Potato insects.—Both the Colorado beetle, (*Doryphora decem-lineata*,) and the common black potato-bug, (*Epicauta* (*atrata*) *pennsylvanica*,) have been heard from in the Middle and Western States. In Cambria County, Pennsylvania, the bugs followed the gathered crop into the cellar, and also fell upon the tomatoes. They swept late plantings in Armstrong, Indiana, and Butler Counties; the Early Rose and other early varieties matured before their advent. The same is reported of Fentress County, Tennessee; bugs are reported also in Dickson and in Tyler, Brooke, Fayette, and Pleasants Counties, West Virginia. They were encountered in Mahoning, Geauga, Erie, and Crawford Counties, Ohio. In Clinton County, Michigan, they were less troublesome than last year, while in Calhoun they were successfully resisted with Paris green. Their ravages were more or less serious in Boone County, Illinois, in Dunn County, Wisconsin, in Ramsey and Nicollet Counties, Minnesota, in Muscatine County, Iowa, in Washington County, Kansas, and in Madison County, Nebraska.

Chinch-bugs (*Micropus* (*Rhyparochromus*) *leucopterus*) are reported in Adams County, Ohio, and in Ripley and Scott Counties, Indiana, where they ravaged wheat, oats, and corn. They were also virulent in Clinton, Edwards, Washington, Pope, and Boone Counties, Illinois, and in Polk, Lawrence, Pulaski, and Phelps Counties, Missouri. In Labette County, Kansas, it is estimated that but for these insects the enormous wheat-crop would have reached another quarter million of bushels.

They were very injurious also in Montgomery, Cherokee, and Wilson. In the last-named county bottom crops generally escaped.

Grub-worms (*Lachnosterna* sp.) damaged grass and corn crops in Highland County, Virginia, and in Mercer and Berkeley Counties, West Virginia.

Fruit-caterpillars (*Clisiocampa*) are reported in Floyd County, Indiana.

Cut-worms (*Agrotis* sp.) were numerous and destructive in Saint Mary's County, Maryland, and in Grundy County, Tennessee.

Tobacco-worms, probably *Macrosila carolina*, were troublesome in Montgomery County, Tennessee, and in Dallas County, Missouri.

Bud-worms.—Insects designated by this unmeaning term were destructive in the corn-crops of Uvalde County, Texas, and Scott County, Arkansas. Several species of destructive insects are known by this name in different parts of the country.

Wheat-midge (*Diplosis tritici*) was observed in Mercer County, West Virginia, and in Ripley County, Indiana.

Hessian fly, (*Cecidomyia destructor*,) Edwards County, Illinois.

Black weevil (*Sitophilus oryzæ*) troubled the wheat-crops in Knox County, Tennessee.

In Grundy County, Tennessee, the grape-crop was injured by several insects. In Sevier County a remarkable absence of birds is mentioned and a consequent prevalence of various destructive insects; red and black oaks were stripped of their foliage, the red oak suffering more than the black. In Floyd County, Indiana, innumerable varieties of worms infested forest trees, the walnut being especially affected.

CHEMICAL MEMORANDA.

By William McMurtrie, Chemist.

Greensand marl.—During the month of April of the present year this Department received from Mr. E. A. Vannort, Hanesville, Kent County, Maryland, a sample of greensand marl for analysis, which has the following composition:

Moisture	3.175
Organic matter	4.475
Silica	48.481
Protoxide of iron	6.430
Peroxide of iron	13.901
Alumina	10.9944
Phosphoric acid	0.0086
Lime	2.116
Magnesia	3.1638
Potassa	6.767
Soda	0.805
	100.3168

This compares very favorably with marls of like character from the extensive deposits of New Jersey and other localities.

Opium from North Carolina.—Many experiments have been tried with varied success in the way of cultivation of poppy in different parts of our country, and this Department has lately received a communication from Mr. F. J. Kron on this subject, accompanied with a speci-

men of opium produced near Albemarle, Stanley County, North Carolina, which presented a very fair appearance. The following is Mr. Kron's communication:

Some four years ago seed of the opium-poppy, originally derived from Turkey, was obtained from the Department of Agriculture and has been experimented with here ever since. The results have demonstrated that both our climate and our soil are well adapted to the production of either poppy-seed for the manufacture of poppy oil, (*huile d'oliette* of the French,) or of opium as good as can be made anywhere. The results have ever shown that the plant here is decidedly hardy; contrary to what is stated concerning it in the report of our consular agent at Smyrna, in 1869, where it is represented as being tender to frost. Here where the temperature some years falls below zero, the seed sown, as in Asia Minor, in the fall, vegetates freely and passes the winter safely, to present, in the spring, plants of remarkable vigor, provided with heads which are numerous and large, far superior to the plants raised from seed sown in the spring. The yield, however, has not thus far been abundant enough to make the culture remunerative. An idea may be formed in that respect from the fact that only 216 grains of opium were obtained from 220 heads. But the quality of the opium produced is something superior to anything we can obtain in commerce. It is all opium; none of the filth and seed which often constitute three-fifths of the bulk of the opium sent to us here. In medicinal properties it will not disappoint the practitioner, but present him with all that is expected from the greatest of boons of Providence to suffering humanity.

The sample of opium sent was free from foreign matters; was well dried, and was quite hard and resinous. When pulverized and subjected to analysis, the air-dried product yielded 5.01 per cent. of pure morphine. This proportion of morphine is rather low; yet it is nearly equal to that of many varieties of opium from India. In order that this result may be compared with results of analyses of opium from other localities, we give below a table of results obtained by different analysts.

Locality.	Percentage of morphine.	Analyst.
Smyrna	12 to 14	Guibourt.
Egyptian (dry)	5.8 to 6.6	"
" (undried)	6 to 7	Merck.
East Indian	5.3 to 7.7	Guibourt.
Persian	11.37	"
Algerian (white poppies)	1.52 to 8.57	Aubergier.
" (red poppies)	10.37 to 11.23	"
" (purple poppies)	14.71 to 17.83	"
Erfurt (blue poppies)	16.6 to 20	Blitz.
" (white poppies)	6.85	"
French (dried), maximum	22.9	Guibourt.
" " minimum	14.8	"
Vermont (Addison County)	15.75	------
California (Marin County)	5.75	------

In the determination of morphine in the North Carolina specimen, the method of Proctor gave the most satisfactory results; 20 grammes of the dry pulverized opium were rubbed with repeated portions of water until finely divided, and allowed to digest twelve hours in about six times their weight of water, when the whole was removed to a filter and washed with water until the washings were completely colorless and tasteless, the fluids thoroughly mixed and divided into portions representing 10 grammes each for duplicate determination.

The solution thus obtained is treated with solution of subacetate of lead as long as precipitate forms, the precipitate being separated by filtration and well washed. To the filtrate add dilute sulphuric acid, drop by

drop, to separate the excess of lead as sulphate, filter and evaporate the fluid to small bulk at a low temperature, mix with an equal volume of alcohol, filter, and treat the filtrate with 15 to 20 grammes of ammonia sp. gr .960, mixed with an equal volume of alcohol. The alcoholic solution of ammonia is divided into two portions, which are added half an hour apart, after which the fluid is allowed to stand twenty-four hours. The morphine, which separates in distinct crystals, is collected on a weighted filter, washed with dilute alcohol and freed from a small quantity of narcotine which may be present by washing with ether. The remaining crystals of morphine are carefully dried and weighed.

FLESH-MEAL. — In our monthly report for July, under the head "Animal farina," we published a description of the process of manufacture of extract of beef at Fray-Bentos, Uraguay, as well as of the refuse consequent upon it, together with experiments upon the use of the latter as feed for cattle. In an article published in a late number of "Die Landwirthschaftlichen Versuchs-stationen," (Bd. XVI, No. 2 u 3,) Dr Pott calls this residue *flesh-meal*, which seems more appropriate than that given in the previous article. He also furnishes results of complete analyses of the product, which are as follows:

100 parts dry flesh-meal contain—

	Per cent.
Water	10.48
Dry substance	89.52
	100.00

100 parts flesh-meal dried at 100° to 110° C. contain—
Ash, (1) 5.46 per cent.; (2) 5.723 per cent.; (3) 5.58 per cent.
Fat, 13.88 per cent.
Nitrogen, (1) 13.27.

100 parts air-dried flesh-meal contain—

	Per cent.
Ash	4.88
Fat	12.42
Nitrogen	12.01

Collection of above data shows the composition of air-dried flesh-meal to be—

	Per cent.
Water	10.48
Ash	4.88
Protein substance*	72.06
Fat	12.42
	99.84

A determination of the soluble and insoluble mineral constituents gave the following results:

100 parts of substance dried at 100° to 110° C. contain—

Constituents soluble in water 6.18 per cent. containing { 0.64 soluble mineral salts. / 5.54 organic constituents. } = 6.18

Insoluble residue, 93.82 per cent. containing { 4.22 per cent. mineral salts. / 89.60 pr cent. organic constituents. } = 93.82

* Found by multiplying amount of nitrogen by 6.

Analysis of the ash.

	In 100 parts crude ash.	Calculated for pure ash.	Calculated for 100 parts dry flesh-meal.
	Per cent.	*Per cent.*	*Per cent.*
Potash	1.990	5.499	0.11
Soda	1.326	3.664	0.07
Lime	8.785	24.049	0.48
Magnesia	1.160	3.205	0.06
Peroxide of iron	5.801	16.015	0.32
Phosphoric acid	15.333	42.376	0.85
Sulphuric acid	0.818	2.426	0.05
Silica	0.663	1.835	0.04
Chlorine	0.307	0.931	0.02
		100.000	2.00
Sand	53.328		
	92.511		
Carbonic acid*	7.489		
	100.000		

For comparison of results, analyses of ash, of flesh-meal, and that of fresh beef are given. All these analyses are calculated for pure ash. The analyses of fresh beef were made, one by Staffel and the other by Stölzel:

	Beef. Staffel.	Beef. Stölzel.	Flesh-meal. Pott.
Crude ash	.....	8.30	5.46
Pure ash	.....	7.60	2.00
Potassa	46.09	48.91	5.499
Soda	.....	.....	3.664
Lime	1.88	0.91	24.049
Magnesia	3.60	2.30	3.205
Peroxide of iron	1.07	0.82	16.015
Phosphoric acid	37.35	36.08	42.376
Sulphuric acid	3.66	3.84	2.426
Silica	2.25	2.47	1.835
Chlorine	5.28	6.04	0.931

DISEASE OF BEECH TREES.—A curious phenomenon has appeared in the beech forests of Westphalia, in the shape of a white coating, principally on the south side of the trees, caused by an exudation of a kind of wax from incisions made in the bark of the trees by a small insect which has been examined and described by Dr. H. Landois, professor of zoology in Münster, as being six-legged, 0.14 millimetre in length, and 0.086 millimetre in breadth. The color of the insect is lemon-yellow.† The wax was examined and analyzed by Dr. I König, who described it as follows:

Under the microscope it appears fine threads; it dissolves in ether and melts at 78°–80° C. This latter property leaves no doubt that the white coating is nothing

*By difference.

† The name of the insect is *Chermes fagi*.

but wax. Its elementary composition compares with beeswax and Chinese wax—the latter produced by puncture of certain species of coccus—as follows:

	New wax.	Beeswax.	Chinese wax.
Melting point	78°80°	60°63°	82°
Carbon	87.39%	87.80%	82.31%
Hydrogen	13.58%	12.67%	13.57%
Oxygen	5.03%	5.53%	4.12%

By saponifying with an alcoholic solution of potash a portion of the wax remains unattacked. This is separated from the solution by filtration through asbestos. The solution agitated with ether yields a body which melts at 49°–51°5 C.; solidifies at 50°–48° C., and has the following elementary composition:

Carbon	76.21%
Hydrogen	12.24%

From the potash solution is precipitated by chlorhydric acid, an acid which melts at 51° to 53° C., solidifies at 50°–59° C., and has the following elementary composition:

Carbon	77.88%
Hydrogen	12.31%

The residue from saponification, which melts at 140°–145° C., seems to contain a higher proportion of carbon than the original wax, and seems to consist of several compounds. The scarcity of material prevented further investigation, but I hope to return to it again.

ATMOSPHERIC NITROGEN IN VEGETATION.—This has for some time been the subject of investigations by P. P. Deherain, and he has lately determined, from experiments with glucose and caustic soda, through which were passed currents of warm air, that considerable quantities of nitrogen were absorbed. When cold air was transmitted through this mixture negative results were in the majority of cases obtained; but on employment of nitrogen gas, part of it was absorbed. Mixtures of saw-dust, with or without slaked lime, produced results which were similar, but less decided. These facts will have an important bearing upon the value of combined nitrogen in fertilizers.

BOTANICAL NOTES.

By Dr. Geo. Vasey, Botanist.

A POISONOUS CALIFORNIA PLANT.—Mr. O. B. Ormsby, of Bakersfield, California, has written to this Department respecting a plant known there as loco, which, he says, is quite destructive to stock, especially horses. He says:

It prevails quite abundantly over an extent of one hundred and fifty square miles in this valley, and, I am informed, is found in other valleys of the State, and also in Arizona. This year the army-worm and a minute insect which destroys the seeds have killed a great deal of it, but, if not molested, it will soon flourish to as great an extent as ever. I think very few, if any, animals eat the loco at first from choice; but, as it resists the drought until other feed is scarce, they are at first starved to it, and, after eating it a short time, appear to prefer it to anything else. Cows are poisoned by it as well as horses, but it takes more of it to affect them. It is also said to poison sheep. As I have seen its action on the horse, the first symptom of the poisoning apparently is hallucination. When led or ridden up to some little obstruction such as a rail or bar lying in the road he stops short, and, if urged, leaps as though it were four

feet high. Next, he is seized with fits of mania in which he is quite uncontrollable, and sometimes dangerous. He rears, sometimes even falling backward, runs or gives several successive leaps forward, and generally falls. His eyes are rolled upward until only the white can be seen, which is strongly injected, and, as he sees nothing, is as apt to leap against a wall or a man as in any other direction. Anything which excites him appears to induce the fits, which, I think, are more apt to occur in crossing water than elsewhere, and the animal sometimes falls so exhausted as to drown in water not over two feet deep. He loses flesh from the first, and sometimes presents the appearance of a walking skeleton. In the next and last stage, he only goes from the "loco" to water and back; his gait is feeble and uncertain; his eyes are sunken, and have a flat, glassy look, and his coat is rough and lusterless. In general the animal appears to perish from starvation and constant excitement of the nervous system, but sometimes appears to suffer acute pain, causing him to expend his strength in running wildly from place to place, pawing, and rolling, until he falls and dies in a few minutes.

From a few specimens sent we determine the plant to be a species of *Astragalus*, somewhat similar to lucerne in its appearance and mode of growth. We invite further information from those acquainted with the plant and with its poisonous qualities.

ORCHARD-GRASS.—Mr. William E. McClure, of Waukesha County, Wisconsin, writes respecting a grass of which he desires to know the name. He says that he obtained a small head two years ago from an old Russian. As the produce of that head he had three quarts of seed which he sowed last June. When ripe, it stands from 4 to 5 feet high, and it is ripe about the middle of June. It is very early in the spring, being 12 to 15 inches high when June grass is but 1 inch. It grows in large bunches as timothy does when sowed thin, but, unlike timothy, it keeps green all through the summer, and stood 1 foot high at the date of his writing, September 29. It stands the winter without injury. The grass is *Dactylis glomerata* or the orchard-grass, so called from its adaptation to growing in the shade. Hon. J. S. Gould says of it:

We have seen it growing in great luxuriance in dense old New England orchards, where no other grass, except *Poa trivialis*, (rough-stalked meadow-grass,) would grow at all. It affords a good bite earlier in the spring than any other grass, except the meadow foxtail. It affords a very great amount of aftermath, and it continues to send out root-leaves until very late in the autumn.

GARRYA ELLIPTICA.—In the "Garden," (London, England,) of August 9, is an interesting account of the *Garrya elliptica* as a hardy evergreen garden-shrub, now being cultivated in England. It is a native of California and Oregon, and was first raised from seeds sent from California by Mr. Douglass in 1828. These proved to be all male plants. The first female plants known in a living state in Europe were sent by Hedwig in 1848, and in 1850 they flowered and fruited, and from their seeds plants of both sexes were afterwards raised. "The bush grows from 8 to 10 feet high, and has a rather dense and spreading head, furnished with numerous slender shoots, which are downy when young but quite smooth when fully matured. It is easily increased, either by layers or by means of cuttings of the half-ripened shoots, and grows freely in any good garden-soil. The leaves are opposite, somewhat oblong or elliptical, with a small acute point, rather wavy when young, thick and leathery in texture, persistent, of a dark shining green above, and hoary beneath. The fruit, which is produced in compact catkins, is a berried pericarp, containing two hard, bony seeds, as large as a moderate-sized black currant, and of nearly the same color."

This is one instance of many in which plants of this country receive more attention as to cultivation and come to be better known abroad than at home. There are several other species of Garrya in Arizona and Mexico which have not yet been introduced into cultivation. The

journal above quoted speaks very approvingly of several species of Collinsia, delicate annual plants of England, which have been introduced into cultivation by Mr. Thompson, of England, who has shown a rare enthusiasm in obtaining from this country and introducing into cultivation botanical novelties. One of these is a new variety of *Centaurea Americana*, with flowers of a deep magenta-purple, which is considered quite an acquisition to the flower-garden. The variety was obtained in Texas in 1872, by Mr. E. Hall, of Illinois, who spent a season there in making botanical collections. Still another acquisition from our country is the *Pentstemon Palmeri*, obtained a few years ago, by Dr. Palmer, in Arizona, which is stated to be a very distinct and novel form of this interesting genus. It grows four feet high or more, the stem terminated by a noble panicle of pale lilac flowers, which are an inch and a half long, and are said to be very ornamental.

INFLUENCE OF THE MOON ON VEGETATION.—M. Carbonnier, a member of the Acclimatization Society, of Paris, has published the result of some observations on the effect of the moon upon vegetation, which tend to confirm the popular notions on this subject:

It is well known that glass aquariums, placed in the light, soon become invaded by algoid growths, which in some cases, after a time, pervade the whole of the interior. M. Carbonnier, requiring to keep a number of these reservoirs perfectly clean, found that, while in some cases no vegetation appeared for ten days, or even more, in others it was completely developed in two or three days. Watching these phenomena with care for some time, he came to the conviction that the maximum intensity of this vegetation corresponded with the time of the full moon; he found that the increase diminished during the other phases of the moon until it was imperceptible; and, while at full moon the aquariums had to be cleaned every day, after that period twice a week proved sufficient. The water that he used for his aquariums is that of the canal of the Ourcq, (too impure for culinary purposes,) which is open for a long distance, and is remarkable for the number of microscopic germs it contains, very variable in quantity, but considerable at the time of the full moon.

As aquariums are now in quite general use, many opportunities are afforded to repeat these observations. It would be curious if, after so long opposing the popular traditions on this subject, modern science should at last confirm them and be able to explain them. The experiments of M. Carbonnier, so far as reported, seem to be wanting in precision, and need to be confirmed by other observers, with careful attention to the source and kind of the water-supply.

MULTIPLYING PLANTS BY DIVISION.—All the prominent operations of horticulture, as grafting, budding, striking, cutting, &c., are based upon the fact that every bud of a plant has an independent vitality, and with suitable treatment and under proper conditions is capable of continued growth when removed from the parent plant. Not only is this true of buds already formed, but portions of a plant, such as a leaf or a root, which do not normally produce buds, can be made to develop them under certain circumstances.

Many curious experiments have been made at various times, showing that this power of reproduction by the development of new organs or parts is possessed in some degree by almost every portion of the plant.

Recently M. Van Tieghem has communicated to the *Annales des Sciences Naturelles* the results of some experiments made by him on the embryos of germinating plants, which show that their several parts may be removed and divided, and still each of the separated parts can reproduce all the other parts necessary to complete the perfect plant. Thus, the germinating plant or seed is composed of the cotyledons or seed-leaves, the caulicle or young stem, and the radicle or young root.

It is shown by M. Van Tieghem that either of these organs may be removed, and have the power to develop the remaining parts, so as to become a perfect plant.

He has gone further than this, and shown that each of these organs may be subdivided into several separate parts, and each subdivision will grow and reproduce the organs wanting to complete the plant. Thus, he divided the radicle lengthwise into two parts; each part grew and developed the remaining organs. The caulicle or young stem was likewise divided in the same manner and with the same result. Also each part of the cotyledons or seed-leaves, when cut into segments, would develop roots and buds and produce perfect plants. For example, the two cotyledons of a germinating sun-flower were divided each into four parts, and each part grew, making eight perfect plants.

"In a word, any fragment will grow independently of the rest, and to a degree proportionate to the quantity of food stored up within itself at the time of its separation."

M. Van Tieghem continued his experiments farther with a view of ascertaining the office performed by the albumen of seeds. The embryo of a Marvel of Peru was removed from the albumen in which it was imbedded. Germination took place, and growth proceeded for a time, but was arrested before the production of the plumule or first bud. Thus, it appeared that a supply of prepared food, such as the albumen furnishes, was necessary to the formation of the plumule.

The next experiments were to ascertain if it was indispensable that this nourishment should be contained within vegetable cells. For this purpose the albumen was removed from the seed, pulverized, and made into a pulp, into which the embryo was placed. An absorption of this nutritive matter took place by the embryo, but not to the same extent as under normal circumstances. The experimenter next tried the substitution of artificial food in place of the natural supply. An artificial albumen of potato-starch was made into a paste and the embryos were imbedded therein. Germination occurred with the absorption of starch grains in the same manner as in normal conditions, but only to a limited extent, as this artificial food was wanting in many of the constituents contained in the natural albumen of the plant under experiment, as oily materials, various salts, and nitrogenous matters, "hence, M. Van Tieghem, in pursuing his experiments, further added to the potato-starch a saline solution containing nitrates and phosphates in various proportions. Under these conditions, germination progressed further than when starch alone was employed. When the albumen from the seeds of buckwheat was mashed up and used as a pabulum for the denuded embryo, the germination also proceeded favorably. Other experiments of like character with flour of wheat were not so successful, by reason of the rapid invasion of moulds and other microscopic organisms which quickly vitiated the trials."

These experiments may have little practical value, but they are at least of great physiological interest. They seem to show that, to some extent, the vegetable cells even of the higher plants retain somewhat the independent vitality possessed by the lowest forms of vegetable life.

AGRICULTURE IN PERSIA.

The recent visit of the Shah of Persia to the principal countries of Europe, whatever may have been its political significance, is regarded as indicative of progress in that ancient and conservative kingdom, and has attracted much attention to the actual condition of Persia, which, renowned as it is in history, is but little known to the world at large in respect to the details of common life. We have heard—and the story has been repeated within a few years—of terrible famine in that country, and the consequent starvation and pestilence, by which its inhabitants have perished by thousands. These famines have been attributed to defective agriculture, in a country susceptible of high and profitable cultivation, and capable even of producing a large surplus of the staff of life, and also to a great want of water, where irrigation for farming purposes is at all times necessary. Persia is known to have carried the art of irrigation to great perfection centuries ago, and her practices in that respect are supposed to have originated the religious reverence so extensively paid to rivers and fountains. The practice of penetrating the mountains in search of springs, and conveying the water when found by subterranean tunnels, even to great distances, for purposes of irrigation, originated in Persia, and is, perhaps, still peculiar to that country. It is probable, however, that the ancient and effective system of irrigation in Persia has not kept pace with the demands of an increasing population; but to what extent it may have been diminished we have no means of knowing. Nor is it known how far agriculture has deteriorated or suffered from neglect in a country which at one time, even under primitive methods of tillage, exhibited an exuberant fertility. Neither is it certain that the famines in question, which were of a local character, are justly attributable to the causes mentioned. Others have ascribed all the evils which Persia has suffered to bad government. The visit of the Shah to the domains of more successful rulers can hardly fail of an ameliorating influence upon his own country and people. In an article in the annual report of this Department for 1871 the want of manufactures, or of a sufficient variety of skilled industry to keep agriculture alive, is regarded as furnishing a complete explanation of the great calamity which befell Persia, or a portion of it, a few years ago. The following translation from a recent French publication contains some statements respecting the present habits of the people and their methods of agriculture which seem to confirm the latter view:

The Persians are the most remarkable people of the great race who, sharing the table-land of Asia, have conquered and occupied the East. History has handed down to us the titles of their origin and grandeur. Their civilization goes back to a remote epoch, and was superior to ours, as the Persians had long been acquainted with agriculture and a settled life while our ancestors were yet nomads. Their country was beautified by smiling gardens that were the object of the admiration and envy of other nations, who have consecrated their memory by the name that designated the birthplace of the first human family; *firdaus* (Greek, paradeisos) is a Persian word signifying garden. An ancient province of this kingdom is still called the "land of roses," (Gulistan.)

The agriculture of the Persians is peculiar. From the most ancient antiquity this people have carried the science of irrigation to great perfection. Herodotus relates that they had a great veneration for water-courses, and the care which they bestowed on their springs and fountains has been deemed worthy of imitation by other nations.

The soil of Persia is generally dry, and water is obtained by artificial methods, such as the digging of wells and the raising of dikes. The water flowing from the mountains after the melting of the snow is received into canals and carried into the fields.

These canals are, with rivers and brooks, subject to the inspection of a public officer called the Prince of Water, and the water is distributed to cultivators, according to their wants, at fixed rates of payment.

In the mountain gorges, where the form of the land permits, the snow and rain waters are arrested by thick walls and are collected in large basins, their level being raised so that they may overflow the soil. Chardin, whose "voyage" is, perhaps, the most faithful and interesting that has been published, says: "There are four kinds of water in Persia—the rivers and springs above land, and subterraneous wells and conduits called *cariges*. They dig at the foot of mountains for water, and when a spring is discovered it is conducted by subterraneous canals sometimes a distance of eight or ten leagues."

Besides irrigation the Persians employ the system of stercoration, so much esteemed by the Romans. They use the litter of horses to manure the land. They litter the horses with their own dung, dried and powdered, of which they make a soft, firmly united bed of two or three inches in thickness. Every morning the excrements of these animals are dried in the court-yard, and in the evening are reduced to powder by a little beating. As they lie all day in the sun they lose their odor, so that the stables do not smell badly. Another means of preventing this odor is also used, which is, to mingle salt with the barley that the horses eat.

The countrymen carefully collect the impurities of the city streets and deposit them in bags, with which they load their asses. There are no public sewers in Persia. Each house has its private sewer, a hole about a foot deep, which is generally dug by the side of the dwelling. These are never offensive, as the dryness of the air dissipates the bad odor. The occupants of houses which have no sewer outside arrange with some trustworthy countryman to take the sewage by the year, charging him a sort of rentage, which is commonly paid by the year, for the privilege of access to the house. These scavengers may be seen with their spades cleaning the ditches, and loading their asses or mules with their contents. They attend to their duties with assiduity, visiting these places weekly. Whenever a warm fertilizer is required, the excrements of men and pigeons, together with melons and cucumbers, are smoked. The countrymen say that there is a notable difference in the fruits raised in those beds in which the manure is obtained from houses whose occupants eat much flesh, or drink the wines of Europe. This fertilizer is not laid upon the land without preparation. It is carried into the country, and there dried by the application of heat. It is then thrown into large ditches, which, when half full, are filled up with earth. Here, for two years, it is exposed to the action of snows and rains that knead the whole mass together. At the end of this time the fertilizer is ready for use.

By means of this culture the soil of Persia, though sandy, becomes firm and clayey, and capable of receiving any kind of seed, producing two crops of barley annually. The land in the neighborhood of large cities is never at rest; for when one crop is gathered, another is planted.

Water is necessary to the fertilization of the soil, and a fruitful valley may be made a desert tract by the destruction of one of the expensive canals. Those parts of the country that are well cultivated indicate the prosperity to which the kingdom may attain.

Throughout Persia there are great plains, which during the winter season are covered with water, while the bare, salty soil is parched by the summer sun. These vast surfaces, if properly watered, might be rendered suitable for cultivation.

The pastures of Persia afford food for numerous flocks of sheep that are owned by some of the itinerant tribes of the country, who do nothing for the amelioration of their species. Some of these sheep have tails weighing more than thirty pounds, which are a great burden to the animals. In certain places the sheep are assisted to carry this burden by a little machine with two wheels.

Kurdistan, a province possessed jointly by Turkey and Persia, exports many sheep and goats. It is estimated that fifteen hundred thousand of these animals are sent yearly to Constantinople. A greater number are exported, but the length and difficulties of the journey cause many to perish. It is a journey of sixteen or seventeen months from Van to the Bosphorus. The Ottoman army which fought the French in Egypt was almost wholly fed by the herds of Kurdistan.

The provices of Northern Persia are very humid. They are covered with snow in winter, and watered in autumn, by abundant rains. The soil is rich and fertile, and many of the trees of Europe not only grow in it, but attain a great height. South of the mountains, on the contrary, the air is very dry. Light clouds float eastwardly; without being resolved to rain. The soil in this section is therefore sandy and arid. No dew covers the plants, and no mist hovers over the highest mountain peaks.

The rivers of Persia that flow into the Caspian Sea are very rapid. But those that water the plains of Ispahan, Kashan, and Shiras, have a more moderate current, and diminish in width as they become distant from their sources. Few run into the ocean; most of them being lost in the sandy plains. This progressive diminution favors their system of trenching.

The cultivated land, covered with crops of wheat and rice, and fruit-trees, presents a verdure more agreeable as it contrasts with the sandy deserts. Oranges and lemons grow abundantly in the Mazanderan. A particular kind of sugar-cane is cultivated here, but the extract, which is yellow and tastes like molasses, is only consumed by the lower classes, as the Persians are ignorant of the art of refining it.

From the midst of these immense orchards, summer-houses, mosques, and palaces arise. If the labors of the cultivator are not hindered by unfortunate circumstances, he soon becomes wealthy. When he has acquired a fortune, he changes neither his condition nor residence. He improves his dwelling, and enjoys the luxuries of his fields, as does the resident of the metropolis. For this reason, in the most mediocre villages of Persia, may be seen the finest and most beautiful residences that contain all the superfluities of opulence.

FACTS FROM VARIOUS SOURCES.

A NEW AGRICULTURAL FIELD.—Mr. E. M. Gibson, Indian agent, stationed at Neah Bay, Washington Territory, reports the result of experiments with seeds forwarded to him by this Department. The locality is in the extreme northwest of the Territory, between 48° and 49° of north latitude. The farm on which the seeds were planted is on a peninsula which extends into the Pacific and forms Cape Flattery, at the mouth of the straits of Juan de Fuca, being the most northwesterly farm in the United States. Mr. Gibson describes the point as one over which heavy fogs hang the greater portion of the summer, and at which there is perhaps more annual rain-fall than at any other place in the country. The nearest settlement is about sixty miles distant. He represents that the small portion of land in that section which is susceptible of cultivation is very productive; and as much the larger part of the population of the Territory is non-productive, being engaged in lumbering, farming is exceedingly profitable. Among the seeds tried were different varieties of cabbage, kale, Brussels sprouts, lettuce, radish, carrot, cauliflower, beet, onion, ruta-baga, and parsnip, all of which produced as well as he had ever known the same kinds to in any climate. Of all the varieties of peas received, (except dwarf,) the vines grew to the height of five feet, and yielded in abundance peas of the largest size and best quality. When the cabbages had grown very large the heads burst open, and some of them continued to grow through the winter, as did the onions, parsnips, and beets. Celery was growing finely, and promises to do well. On the other hand, corn, beans, tomatoes, and cucumbers scarcely grew at all, and did not produce anything.

IMPORTATION OF SILKS.—The monthly statistics of the Silk Association of America show that the value of manufactures of silk imported at New York, in September, 1873, was $3,404,067, against $3,607,412 in the corresponding month in 1872, $4,254,286 in 1871, and $3,900,726 in 1870. The total value of manufactures of silk imported at New York during the first nine months of 1873 was $21,277,727, against $28,987,343, during the corresponding months in 1872, $27,934,004 in 1871, and $20,219,064 in 1870.

The above values represent only the foreign cost in gold, the costs of freight and duties not being included.

RECIPE FOR FOOT-ROT AND SCAB.—Mr. John Hill, of Henrico County, Virginia, recommends the following as very reliable remedies for the above-named diseases of sheep:

For foot-root.—First cleanse the foot, then pare away the portions of the hoof covering the diseased part, and apply the following to all the flesh affected by fungus

growth: Mix gunpowder and blue vitriol in equal quantities, and to seven parts of this mixture add one part of verdigris and sufficient sweet-oil to make a salve. Apply this salve twice a week, keeping the sheep dry-footed for an hour or so after each application.

For scab.—Make a strong lye from hard-wood ashes, as oak or hickory; add to each gallon of lye one pound of strong tobacco; simmer over a moderate fire for about an hour, then strain and add to each gallon of the liquid a quarter of a pound of the flour of brimstone, the same quantity of hellebore powder, a half pint of the spirits of turpentine, and a large tablespoonful of carbolic acid. The mixture is then fit for use as a "dip," (for which the best time is after shearing) or otherwise. It should be well stirred before using, and kept from the eyes and mouth. It is well, before applying, to scratch the affected parts with a curry-comb, or something similar. If the weather is wet the sheep should be kept under cover for a short time after the application. The remedy should be applied once or twice a week.

IRRIGATION IN CALIFORNIA.—It is reported that farmers in Merced County, California, have associated for the purpose of constructing a canal for irrigation, leading out of Merced River. The estimated cost is $6,000, of which $3,000 have already been subscribed. The annual tax to those who use it is to be $1 per acre for each acre irrigated.

YIELD AND PRICE OF GRAIN.—Mr. H. S. Hart, secretary of the Agricultural Society in Fillmore County, Minnesota, reports that some fields of wheat in that county yielded as high as 32 bushels per acre, while the average was about 22 bushels. Most of the crop averages 60 pounds to the measured bushel as it comes from the machine, and the best quality has been selling at 85 cents per bushel. He reports the oat crop in that section good, and the barley-crop very good, though injured by being left too long in the shock in consequence of the superior claims of the wheat-harvest.

CAROLINA RICE IN INDIA.—As the result of experiments with Carolina rice, for several years in succession, on the experimental farm in the district of Madras, India, the following conclusions have been reached: First, when properly cultivated, it does not deteriorate; second, it requires a higher order of cultivation than has heretofore been practiced in India; third, under conditions of soil adapted to its improved habits, it may be profitably grown. The indigenous variety suffers less than that under unfavorable conditions of soil and season, just as native scrubs will suffer less from inferior feed and undue exposure and neglect than thorough-bred short-horns; but it does not follow in either case that the unimproved variety is the more profitable to grow. It is found that the roots of native rice are short and grow at right angles with the stem, very near the surface, while the roots of Carolina rice grow longer and strike downward; hence it is inferred that those follow the dictates of common sense who maintain that flooding rice-lands is not a sufficient preparation for the crop, but that the soil should be further prepared for aeration, filtration, and penetration by the roots, by sub-soil drainage.

THRIFT IN FLORIDA.—A former correspondent reports that Orange County, Florida, is making rapid progress in population and wealth. It unites the advantages of diversified and beautiful scenery, a remarkably healthy climate, a productive and well-watered soil, and easy access to market. The climate and soil have been proved by trial to be well adapted to the growth of oranges, lemons, and almost every other variety of semi-tropical fruits, as well as the principal vegetables. These attractions having become known, are drawing immigrants from almost every State in the Union. The voters in the county, three or four years ago, numbered less than 200; they now number about 800; and lands which,

five years ago, could be bought at 25 cents to $1 per acre, now bring $50 to $150 per acre.

PROFIT IN CABBAGES.—Our correspondent in Princess Anne County, Virginia, reports that one farmer, from 300,000 plants set out in November and December, obtained a spring crop of cabbages amounting in value to $13,000.

EPIZOOTY AMONG HOGS.—Our correspondent in Page County, Virginia, describes a destructive disease among hogs in that county, the symptoms of which are analogous to those of the horse epizooty.

EXCESSIVE RAIN-FALL.—In Sampson County, North Carolina, the rain-fall during the whole year has exceeded that of any former year within the recollection of the oldest inhabitant.

MORTGAGED CROPS.—Our correspondent in Poole County, Georgia, says: "The heavy bills to be paid for fertilizers and provisions, with the short crop of cotton, will ruin the farmers in this county."

SENSIBLE CONCLUSION.—The farmers of Carroll County, Georgia, have quite generally become convinced of the ruinous character of exclusive cotton production, and propose to raise more grain and meat hereafter.

CATTLE VS. FENCES.—In Greene County, Alabama, the absence of fences and the depredations of stock running at large prevent the sowing of winter crops of small grain.

SUFFERING IN LOUISIANA.—There will be much suffering for bread during the coming winter among the small Creole farmers of Terrebonne Parish, Louisiana. Within the memory of the oldest planters there never was a season in which the rains set in so early and continued so persistently as during the past season; very few intervals for labor were allowed.

DROUGHT IN TENNESSEE.—In Madison County, Tennessee, there has been no rain since July 1; in Lawrence County since August 1.

TOO MUCH "CULTIVATION."—Our correspondent in Greenville district, South Carolina, says that cotton is "cultivated" there nine times in a season, which subjects the soil to great loss from working.

CANNING TOMATOES.—The business of canning tomatoes has largely increased in Cumberland County, New Jersey, where $100,000 worth of that vegetable are annually raised for this purpose.

NORTHERN IMMIGRANTS IN THE SOUTH.—Quite a colony of skilled farm laborers have been induced to migrate from Ohio and Michigan to Walker County, Alabama, a movement which has awakened a considerable spirit of improvement in that region.

CASTOR-BEANS.—In Perry County, Illinois, the castor-bean (*Palma christi*) is raised in large quantities, and an increased area is annually devoted to the culture. An unusually fine crop has just been raised which is selling at $2 per bushel.

FARM-PROFITS.—The average yield of farm-products in York County, Maine, will compare favorably with the yield of ten years past; the sales of the past season have been rapid.

WHEAT AND STOCK GROWING.—Morris County, Missouri, presents fine prospects to wheat and stock growers.

CATTLE DISEASE.—A malady has prevailed among cattle in Wash-

ington County, Kansas, which awakens much concern in that locality. The affected animals are first taken with foaming at the mouth followed by spasms and paralysis; death supervenes in a few hours. The only remedy that has been found effective is a solution of common salt given in doses of a pint or quart. On dissection the mucus membrane of the stomach and intestines was found full of worms.

PRICES OF LABOR.—In Talbot County, Maryland, farm-laborers receive from 75 cents to $1 per day with board.

ORANGES IN FLORIDA.—The orange season in Putnam County, Florida, is one of the finest for thirty years; many young trees are just coming into bearing; the fruit is above average in size.

FARMING IN TEXAS.—In Bandera County, Texas, the past season has been one of disaster to farmers. Grasshoppers and early frosts are spoken of by one correspondent among the causes of this state of things. In Lampasas County, great floods are reported; in Lampasas Town, forty houses were washed away. Many farms greatly injured or destroyed.

FARMING PROSPECTS IN CALIFORNIA.—The farmers of Placer County, California, are elated with fine crops and good prices; wheat and barley are now at a higher market figure than for many years. From Plumas County comes a report less exhilarating. A series of heavy frosts during May and June, unprecedented since the settlement of the county, has crippled the growth of crops generally. Added to this, water is scarce for irrigation purposes on account of several extremely dry seasons.

RYE IN WASHINGTON TERRITORY.—Mr. Owen Bush, of Thurston County, Washington Territory, raised 40 acres of winter-rye; soil dry and sandy, having been under cultivation for twenty years, about half the time, and never manured. He realized 22 bushels per acre and marketed 200 bushels at 85 cents. He estimates his receipts and expenses per acre, as follows: 22 bushels at 85 cents each, $18.70; straw, $5; fall feed, $3; total, $26.70. The cost of cultivation, seed, &c., amounted to $7.25, leaving a balance of $19.45 as the residuary profit per acre.

DESTRUCTIVE STORM IN THE GULF STATES.—A terrible storm devastated the crops of Southern Georgia and Middle Florida, September 19. In Gadsden County, Florida, it raged with unprecedented violence from 4 o'clock a. m. till noon. The cotton which was opened by the previous fine weather was extensively destroyed or injured. In Leon County at least a third of the gin-houses were destroyed and a fourth of the unpicked cotton. The same destructive storm was felt to a smaller extent in Madison County, and also in Liberty County, Georgia. In Clarendon County the heaviest rain-fall ever known was experienced September 18 and 19.

CROPS IN NEW MEXICO.—Our correspondent from Santa Fé County, New Mexico, reports a remarkable recuperation of crops from the injuries of drought through the medium of late summer rains. The corn seemed to spring at once into a vigorous growth, and to hurry toward a full development. Grama grass quickly covered the region around Santa Fé and the southwestern portion of the Territory with a luxuriant vegetation. Fruits and vegetables of late have come into market in full supplies, though dwarfed by the earlier drought. Grapes, especially, showed the effects of this injurious influence.

MARKET PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, at the beginning of the month of October, 1873:

Articles.	Price.
NEW YORK.	
Flour, superfine State...per bbl.	$5 15 to $5 85
extra State ...do...	6 35 to 7 25
superfine western ...do...	5 15 to 5 85
extra to choice western, per barrel ...do...	6 30 to 10 50
southern, common to fair, per barrel ...do...	6 65 to 7 35
southern, good to choice, per barrel ...do...	7 40 to 10 75
Wheat, No. 1 spring ...per bush.	1 48 to 1 50
No. 2 spring ...do...	1 40 to 1 45
winter, red, west'n ...do...	1 58 to 1 61
winter, amber, western, per bushel ...do...	1 62 to 1 63
winter, white, western, per bushel ...do...	1 62 to 1 78
Rye ...per bush.	89 to —
Barley ...do...	1 40 to —
Corn ...do...	62½ to 68
Oats ...do...	50 to 57½
Hay, first quality ...per ton.	26 00 to 28 00
second quality ...do...	22 00 to 25 00
Pork, mess ...per bbl.	17 00 to — —
extra prime ...do...	14 75 to — —
prime mess ...do...	15 75 to 16 50
Lard ...per lb.	8⅜ to 8⅝
Beef, plain mess ...per barrel.	8 50 to 10 00
extra mess ...do...	10 00 to 12 00
Butter, western ...per lb.	17 to 31
State dairy ...do...	26 to 37
Cheese, western, factory ...do...	11½ to 12
State factory ...do...	12½ to 13½
Cotton, ordinary to good ordinary ...per lb.	14⅞ to 17⅛
low middling to good middling ...per lb.	17⅞ to 20⅛
Sugar, soft yellow ...do...	9⅜ to 10⅜
soft white ...do...	10⅝ to 10¾
Tobacco, lug, all grades, per pound	7 to 7¾
common to medium leaf, all grades per lb.	7¾ to 8¼
Wool, American XXX and picklock ...per lb.	58 to 62½
American X and XX, per pound	48 to 55
American, combing per lb.	57 to 63
California spring clip, per pound	25 to 35
California fall clip, per pound	19 to 25
Texas ...per lb.	18 to 35
BOSTON.	
Flour, western, superfine per bbl.	5 00 to 5 50
western extras ...do...	6 25 to 9 00
western choice ...do...	9 00 to 11 25
southern extras ...do...	6 25 to 7 00
choice Baltimore ...do...	9 00 to 11 00
Wheat ...per bush.	1 50 to 1 85
Rye ...do...	1 00 to 1 50
Barley ...do...	— — to — —
Oats, western ...do...	50 to 57
Corn, southern yellow ...do...	74 to 75
western yellow ...do...	74 to 75
Hay, eastern and northern, per ton	18 00 to 27 00
Hay, western choice ...per ton.	24 00 to 26 00
Beef, western mess ...per bbl.	10 50 to 12 50
western extra ...do...	12 50 to 13 50

Articles.	Price.
BOSTON—Continued.	
Pork, prime ...do...	$15 00 to $15 50
mess ...do...	18 00 to 18 50
Lard ...per lb.	8¾ to 9½
Butter, N. Y. and Vt., fair to choice, per pound	25 to 36
Butter, western, fair to choice, per pound	22 to 30
Cheese, N. Y. and Vt. factory, choice, per pound	13 to 13½
Western factory, choice, per pound	12½ to 13
Cotton, ordinary to good ordinary ...per lb.	14 to 17¼
low middling to good middling ...per lb.	17⅞ to 20
Sugar, fair to good refining ...do...	7⅞ to 8⅝
Tobacco, lugs ...do...	7½ to 9
common to medium leaf ...per lb.	9 to 10½
Wool, Ohio and Pa ...do...	46 to 65
Michigan ...do...	43 to 51
other western ...do...	42 to 49
pulled ...do...	25 to 56
combing fleece ...do...	57 to 62½
California ...do...	17 to 35
Texas ...do...	18 to 30
PHILADELPHIA.	
Flour, superfine ...per bbl.	4 00 to 4 50
Pa. extra ...do...	4 00 to 5 50
Pa. family ...do...	6 75 to 8 25
western family ...do...	7 00 to 8 50
western, fancy ...do...	8 50 to 10 50
Wheat, winter red, western, per bushel	1 50 to 1 58
Pennsylvania red per bu.	1 50 to 1 58
southern red ...do...	1 55 to 1 60
amber ...do...	1 60 to 1 68
white ...do...	1 65 to 1 80
Rye, western and Pa ...do...	88 to 90
Corn, yellow ...do...	67 to 68
white ...do...	63 to 65
Oats, white ...do...	49 to 51
black ...do...	43 to 45
Hay, fresh, baled ...per ton.	26 00 to 28 00
common to fair shipping, per ton	20 00 to 22 00
Pork, mess ...per bbl.	17 00 to 17 25
prime ...do...	14 00 to — —
prime, mess ...do...	15 50 to — —
Lard ...per lb	8⅜ to 11½
Beef, western mess ...per bbl.	8 00 to 10 00
extra mess ...do...	10 00 to 12 00
Warthman's, city family ...do...	15 00 to — —
Butter, choice, tub and firkin, per lb.	38 to 40
fair to good do ...do...	30 to 35
Cheese, N. Y. factory ...do...	13 to 14½
Ohio factory ...do...	13 to 14
Sugar, fair to good refining ...do...	7⅜ to 8
Cotton, ordinary to good ordinary ...per lb.	14 to 17¼
low middling to good middling ...per lb.	17¾ to 20
BALTIMORE.	
Flour, superfine ...per bbl.	5 00 to 8 25
extras ...do...	6 00 to 8 50
family and fancy ...do...	7 50 to 11 00

Market prices of farm-products—Continued.

Articles.	Price.		
BALTIMORE—Continued.			
Wheat, white, fair to choice, per bushel	$1 50	to	$1 75
amber, choice, per bush.	1 73	to	1 76
red, common to prime, per bushel	1 40	to	1 70
red, western, per bush.	1 40	to	1 50
Rye, common to prime, do	80	to	85
Corn, white southern, do	68	to	70
yellow southern, do	64	to	65
mixed western, do	65	to	—
Oats, southern, do	43	to	47
western, do	44	to	47
Hay, western and Pa., per ton.	20 00	to	25 00
New York, do	22 00	to	26 00
Maryland, do	25 00	to	28 00
Pork, mess, per bbl.	17 75	to	18 00
Beef, Baltimore mess, do	15 00	to	20 00
extra, do	23 00	to	25 00
Lard, per lb.	8¼	to	9
Butter, western, do	20	to	26
eastern, do	22	to	26
Cheese, eastern cutting, per lb.	13½	to	14
western cutting, do	13½	to	14
Sugar, fair to good refined, do	7¾	to	8⅛
Tobacco, common to good lugs, per cental	6 00	to	8 00
common to medium leaf, per cental	8 00	to	11 00
Cotton, ordinary to good ordinary, per lb.	14	to	15¾
low middling to middling, per lb.	16½	to	17¾
Wool, fleece-washed, do	45	to	50
unwashed, free from burrs, per lb	33	to	35
pulled, per lb.	35	to	38
CINCINNATI.			
Flour, superfine, per bbl.	5 00	to	5 50
extra, do	6 40	to	6 75
family and fancy, do	6 90	to	8 25
Wheat, good to prime red winter per bushel	1 30	to	1 35
hill, per bush.	1 40	to	1 45
white, per bush.	1 45	to	1 50
Rye, do	78	to	82
Barley, do	1 20	to	1 50
Corn, do	48	to	56
Oats, do	37	to	44
Hay, baled, No. 1, per ton.	16 00	to	17 00
lower grades, do	12 00	to	15 00
Beef, plate, per bbl.	12 00	to	13 00
Pork, mess, do	14 50	to	15 00
Lard, per lb	7	to	7⅜
Butter, choice, do	27	to	30
fair to good, do	20	to	23
Cheese, best factory, do	13½	to	14
Sugar, N. O., fair to good, do	10	to	10¼
N. O., choice, do	10¼	to	—
Tobacco, lugs, do	7	to	15
leaf, do	9	to	31
Cotton, ordinary to good ordinary, per lb.	14	to	15¼
low middling to good middling, per lb.	16¼	to	18¼
Wool, fleece-washed, common to fine, per lb.	42	to	45
tub-washed, do	45	to	48
unwashed, clothing, do	28	to	30
unwashed, combing, do	35	to	36
pulled, do	33	to	35
CHICAGO.			
Flour, spring extras, per bbl.	5 50	to	6 50
Wheat, No. 1 spring, per bush.	1 04½	to	1 06
No. 2 spring, do	93	to	1 03
No. 3 spring, do	92	to	93½

Articles.	Price.		
CHICAGO—Continued.			
Rye, No. 2, do	$0 57	to	$0 62
Barley, No. 2, do	1 28	to	1 30
Corn, No. 2, do	34	to	37
Oats, No 2, do	30½	to	32
Hay, timothy, per ton.	10 00	to	15 00
prairie, do	8 00	to	10 50
Beef, mess, per bbl	8 75	to	9 00
extra, do	9 75	to	10 00
Pork, mess, do	14 50	to	— —
Lard, per lb.	7¾	to	10½
Butter, choice yellow, do	25	to	28
medium to good, do	18	to	22
Cheese, N. Y. factory, per lb	12	to	13
Ohio and western factory, per lb.	10	to	12
Sugar, N. O., common to fair, do	8	to	9¾
N. O., choice, do	9¾	to	10½
Wool, tub-washed, do	40	to	52
fleece-washed, do	38	to	44
unwashed, do	25	to	32
pulled, do	35	to	38
SAINT LOUIS.			
Flour, superfines, per bbl	4 00	to	4 70
extra, do	5 75	to	7 50
choice and family, do	7 75	to	8 40
Wheat, red winter, No. 1, per bush.	1 43	to	1 50
red winter, No. 1, do	1 35	to	1 40
spring, No. 2, do	1 06	to	1 11
Rye, No. 2, do	63	to	65
Barley, do	1 05	to	1 55
Corn, do	40	to	51
Oats, white, do	35	to	41
Hay, choice and extra, per ton.	17 00	to	18 50
Pork, mess, per bbl.	15 50	to	16 00
Beef, mess, family, do	14 00	to	— —
Lard, per lb.	8¾	to	9⅜
Butter, choice dairy, do	28	to	30
medium, do	20	to	25
Cheese, Ohio factory, do	13	to	13½
N. Y. factory, do	13	to	14
Cotton, middling, do	17½	to	— —
Wool, tub-washed, do	45	to	47
unwashed combing, do	22	to	35
NEW ORLEANS.			
Flour, superfine, per bbl.	5 00	to	— —
extra, do	5 50	to	7 50
choice, do	7 75	to	9 75
Corn, white, choice, per bush	— —	to	73
yellow, do	— —	to	75
Oats, choice, do	50	to	53
Hay, choice, per ton.	26 00	to	27 00
prime, do	23 50	to	24 50
Pork, mess, per bbl.	17 00	to	— —
Beef, Texas, do	8 50	to	— —
northern and western, per barrel	14 00	to	15 00
Fulton market, per ½ bbl.	10 75	to	11 00
Lard, per lb.	8⅝	to	10½
Butter, choice western, do	26	to	28
choice Goshen, do	36	to	38
Cheese, choice western factory, per pound	16	to	16½
N. Y. cream, per lb.	17	to	18
Sugar, fair to fully fair, do	9⅜	to	10⅛
prime to choice, do	10⅛	to	— —
Tobacco, lugs, do	8	to	8½
low leaf, do	9	to	9½
medium leaf, do	10	to	10½
Cotton, good ordinary, do	16⅝	to	16½
low middling to good middling, per lb.	17½	to	18⅝
Wool, clear lake, per lb.	26	to	27
Louisiana, clear, do	19	to	21

Market prices of farm-products—Continued.

Articles.	Price.	Articles.	Price.
SAN FRANCISCO.		SAN FRANCISCO—Continued.	
Flour, superfine ..... per bbl.	$5 75 to $6 00	Pork, prime mess ..... do...	$16 00 to $17 50
extra ..... do...	6 75 to 7 00	Beef, mess ..... do...	10 00 to 10 50
higher grades ..... do...	7 00 to 7 25	Lard ..... per lb.	9½ to 12
Wheat, State ..... per cental.	2 05 to 2 25	Butter, overland ..... do...	20 to 25
Oregon ..... do...	2 05 to 2 25	California ..... do...	30 to 45
Barley ..... do...	1 40 to 1 65	Oregon ..... do...	15 to 20
Oats ..... do...	1 65 to 1 90	Cheese ..... do...	10 to 15
Corn, white ..... do...	1 60 to 1 65	Wool, native ..... do...	13 to 15
yellow ..... do...	1 60 to 1 65	Californian ..... do...	18 to 25
Hay, State ..... per ton.	13 00 to 16 00	Oregon ..... do...	24 to 25
Pork, mess. ..... per bbl.	18 00 to 18 50		

LIVE-STOCK MARKETS.

Articles.	Price.	Articles.	Price.
NEW YORK.		CINCINNATI—Continued.	
Cattle, native steers, per cental.	$11 00 to $12 25	Cattle, good to prime ..... do...	$3 75 to $4 50
good Cherokees ..... do...	10 00 to ——	Sheep, inferior to prime, per cental	2 75 to 4 25
Texans ..... do...	7 50 to 8 50	lambs ..... per cental.	4 00 to 5 25
Sheep, adult ..... do...	4 75 to 6 25	Swine ..... do...	4 00 to 4 60
lambs ..... do...	7 00 to 8 75		
Swine ..... do...	6 00 to — —		
BOSTON.		CHICAGO.	
Cattle, choice beeves .. per cental.	7 00 to — —	Cattle, extra graded steers, 1,400 pounds and upward, per cental	5 75 to 6 00
extra ..... do...	6 00 to 6 50	choice, fat, and well-formed steers, from 1,300 to 1,450 pounds ..... per cental.	5 25 to 5 60
first quality ..... do...	5 00 to 5 75	good, fat, and well-formed steers, from 1,200 to 1,350 pounds ..... per cental.	4 60 to 5 00
second quality ..... do...	4 50 to 5 00	medium steers, fair fleshed, 1,150 to 1,250 pounds, per cental	4 25 to 4 50
third quality ..... do...	3 37 to 4 00	butchers' stock, common to fair steers and good to extra cows, 800 to 1,000 pounds .per cental.	3 00 to 3 75
working-oxen ... per pair.	100 00 to 225 00	common cattle in decent flesh, 700 to 1,050 pounds, per cental	2 75 to 3 85
milch cows with calves, per head	35 00 to 60 00	Texans, choice corn-fed, per cental	4 50 to 4 75
extra ..... per head.	65 00 to 80 00	Texans, north-wintered, per cental	3 25 to 4 25
farrow cows ..... do...	15 00 to 30 00	Texans, through droves, per cental	1 75 to 2 75
yearlings ..... do...	10 00 to 18 00	Sheep, common to choice, per cental	3 25 to 4 75
veal calves ..... do...	4 00 to 15 00	Swine, inferior to extra, per cental	4 00 to 4 55
Sheep, in lots ..... do...	2 25 to 3 50	bulk of sales ..... do...	4 35 to 4 50
extra ..... do...	4 00 to 5 00		
Swine, western fat ... per cental.	5 50 to 5 75		
PHILADELPHIA.		SAINT LOUIS.	
Cattle, fair to choice ... per cental.	5 50 to 7 25	Cattle, choice native steers, 1,300 to 1,600 pounds, per cental.	5 25 to 5 50
common ..... do...	4 00 to 5 00	prime second-class natives, 1,150 to 1,400 pounds, per cental	4 75 to 5 00
Sheep, fair to good ..... do...	4 00 to 5 75	third-grade natives, 1,000 to 1,200 pounds, per cental	3 75 to 4 00
common ..... per head.	2 00 to 3 50	thrifty stock steers, 900 to 1,300 pounds, per cental	3 50 to 3 75
Swine, corn-fed ..... per cental.	7 25 to — —		
BALTIMORE.			
Cattle, best beeves .... per cental.	5 00 to 6 00		
first quality ..... do...	4 50 to 5 00		
medium or good fair quality ..... per cental.	3 50 to 4 25		
ordinary thin steers, oxen or cows ..... per cental.	3 00 to 3 50		
general average of the market ..... per cental.	4 62 to — —		
extreme range ..... do...	3 00 to 6 00		
Sheep, stock animals .. per head.	2 00 to 2 50		
lambs ..... do...	2 00 to 2 50		
Swine, common and still-fed, per cental	6 75 to — —		
best corn-fed .. per cental.	7 37 to — —		
CINCINNATI.			
Cattle, common ..... per cental.	2 25 to 2 50		
medium ..... do...	2 75 to 3 25		

Live-stock markets—Continued.

Articles.	Price.	Articles.	Price.
SAINT LOUIS—Continued.		SAINT LOUIS—Continued.	
Cattle, light uneven stock steers 500 to 850 pounds, per cental	$2 75 to $3 25	Mules, 15½ to 16 hands high, per head	$120 00 to $150 00
good to choice, corn-fattened, Cherokees and Texans, per cental	2 50 to 3 75	extra.....per head.	— — to 180 00
inferior to common Texans and Cherokees, per cental	1 50 to 2 00	NEW ORLEANS.	
Sheep.....per cental.	3 62½ to 3 65	Cattle, Texas beeves, choice, per head	— — to 50 00
Swine.....do...	3 75 to 4 00	Texas beeves, first quality, per head	35 00 to 45 00
Horses, good driving animals, per head	125 00 to 175 00	Texas beeves, second quality.....per head.	20 00 to 28 00
extra.....per head.	— — to 225 00	Western beeves, net, per cental	10 00 to 12 50
heavy draught-horses, per head	120 00 to 185 00	Milch cows, choice, per h'd	80 00 to 100 00
Mules, good heavy animals, per head	120 00 to 150 00	Sheep, first quality....per head.	4 00 to 5 00
extra.....per head.	— — to 180 00	second quality.....do...	3 00 to 4 00
		third quality.....do...	2 00 to 3 00
		Swine, gross .....per cental.	6 00 to 7 00

FOREIGN MARKETS.

WHEAT.—The Mark Lane (London) Express states that the British harvest was a very bad one, especially in the north of England and in Scotland. In many localities the excessive rain-fall, accompanied by storms of thunder and wind, not only interfered with the gathering of the crops, but also threatened to ruin them in the shock. A large proportion of the grain was in danger of sprouting. From extended inquiries, before these rains set in, it was estimated that the yield would average three-quarters or 24 bushels per acre, which, upon an area of 3,490,392 acres sown in wheat, would give an aggregate crop of 10,796,871 quarters or 86,374,968 bushels, of which a million quarters would be required for seed, leaving for consumption 78,374,968 bushels. Taking the population at thirty millions and allowing an average consumption of 6 bushels per capita, there would be a deficiency of over twelve and a half million quarters, or a hundred million bushels, to be met by foreign importation. The unpropitious harvest weather aggravated the difficulty by depreciating the effectiveness of even the small crop secured. The decrease in the English and Scottish wheat area compared with 1872 was 108,565 acres, while in Ireland the decline amounted to 56,859 acres. The wheat-crop in France was so shortened by unfavorable conditions of growth and gathering that a deficiency variously estimated from two and a half to five million quarters was apprehended. Buyers from France were upon the English market all through September, but shipments to that country had received a check by the announcement of the Minister of the Interior to the effect that six or seven millions of hectoliters, or from seventeen to twenty millions of bushels, would meet the French deficiency. This official utterance was criticised by the Echo Agricole as injudicious, and likely to arrest importations and produce an unnecessary scarcity. Several other European countries, with short crops, will require large importations of wheat, while nearly all the large wheat-growing regions indicate a diminished yield. Early in August the International Corn and Seed League, in session at Vienna, estimated that the Austro-Hungarian Empire would export only 800,000 quarters; whereas, in favorable seasons, Hungary alone exports three times that amount. The delegates of Germany did not estimate the crop of that empire at any figure higher

than usual. The yield of Southern Russia was not reported. Odessa prices were remarkably high, the result of a poor harvest. All the indications pointed to short supplies and high prices in Europe.

The last week in September opened upon moderate supplies of English wheat in London with good foreign arrivals, of which one-half were from America and the remainder mostly from Australia and Russia. The London weekly averages during September were as follows: 63*s.* on 4,956 quarters; 66*s.* 3*d.* on 2,759 quarters; 66*s.* 4*d.* on 2.635 quarters; 63*s.* 11*d.* on 4,713 quarters. The importations into the United Kingdom during those four weeks embraced 3,151,197 cwts. of wheat and 385,403 cwts. of flour. The stocks of old wheat both in England and on the continent appear to have been entirely exhausted. Essex and Kent new white is quoted at 54*s.* to 68*s.* per quarter in Mark Lane; ditto, red., 54*s.* to 61*s.*; Norfolk, Lincolnshire, and Yorkshire, 53*s.* to 58*s.* Foreign wheats, Dantzic and Königsberg, mixed, 62*s.* to 66*s.* per quarter; extra, ditto, 68*s.* to 71*s.*; Rostock, 61*s.* to 70*s.*; Silesian red, 57*s.* to 61*s.*; ditto, white, 62*s.* to 64*s.*; Pomerania, Mecklenburg, and Uckermark, red, 61*s.* to 63*s.*; Ghirka, 55*s.* to 60*s.*; Russian, hard, 52*s.* to 56*s.*; Saxonska, 60*s.* to 63*s.*; Danish and Holstein, red, 61*s.* to 63*s.*; American, 55*s.* to 61*s.*; Chilian, white, 63*s.*; Californian, 65*s.*; Australian, 65*s.* to 66*s.*

In the Liverpool market American white wheat brought 13*s.* per cental; spring No. 1, 12*s.* 4*d.* to 12*s.* 6*d.*; spring No. 2, 12*s.* to 12*s.* 2*d.*; Canadian white, 12*s.* 8*d.* to 12*s.* 10*d.*; ditto red, 12*s.* 4*d.* to 12*s.* 6*d.*; Californian white, 12*s.* 10*d.* to 13*s.* 6*d.*; Chilian white, 12*s.* 6*d.* to 12*s.* 8*d.*; Australian white, 13*s.* 4*d.* to 13*s.* 6*d.*; Spanish white, 12*s.* 10*d.* to 13*s.* 4*d.*; Danubian, 7*s.* to 9*s.*; Ghirka, 11*s.* 6*d.* to 12*s.* 2*d.*; Egyptian, 10*s.* 4*d.* to 12*s.* 8*d.*

In Paris the wheat trade was better furnished with samples, and a slight reaction from previous high prices was discernible. Sales could be made only by yielding about a shilling from the published quotations; extra fine white Mayenne wheat brought about 72*s.* per quarter; lower qualities down to 67*s.* The growers generally demanded from 66*s.* 6*d.* to 68*s.* At Havre, Oregon wheat was offered at 72*s.*; Californian, 71*s.*; and American spring at 64*s.* The price of wheat in the French interior markets declined 1*s.* 2*d.* to 3*s.* 6*d.* per quarter. In Belgium, markets showed a downward tendency and were lower at Hamburg. Berlin was calm, wheat for September and October being quoted at 56*s.* per quarter. In Germany demand was still in excess of supply, with considerable sprouted wheat. Egyptian supplies were limited and prices were kept up.

Flour.—At the opening of the last week in September English flour was in good supply in the London market, and foreign in moderate quantity. The course of the week developed no special changes, except, perhaps, an increasing dullness in the market. Foreign wheat was in limited request at a shade below former rates, the sales being in favor of buyers. Friday's sales of foreign amounted to 200 sacks and 9,580 barrels. Country wheats were equally inert. The best English town households brought from 50*s.* to 57*s.* per 280 pounds; best country households, 45*s.* to 47*s.*; Norfolk and Suffolk, 39*s.* to 44*s.*; American, per barrel, 28*s.* to 30*s.*; extra and double extra ditto, 31*s.* to 32*s.*

In Liverpool English and Irish superfines brought from 44*s.* to 45*s.* 6*d.* per 280 pounds; extra, 45*s.* 6*d.* to 50*s.*; French, 50*s.* to 57*s.*; Spanish, 49*s.* to 50*s.*; Trieste and Hungarian, 66*s.* to 75*s.* 6*d.*; Chilian and Californian, 46*s.* to 52*s.*; American, per barrel, Western State, 30*s.* to 32*s.*; extra, 32*s.* to 34*s.* 6*d.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Ohio, 31*s.* to 35*s.*; Canadian, 31*s.* to 36*s.*

Paris markets were dull and drooping, the prices for consumption closing at 53*s.* 4*d.* to 56*s.* per 280 pounds. The eight marks for September were 56*s.* per 280 pounds, and for October, 58*s.* 10*d.* Superior flour for September, 53*s.* 10*d.*; for October, 54*s.*

MAIZE.—*London:* American white at the close of September brought 30*s.* to 34*s.* per quarter; yellow, 30*s.* to 32*s.* *Liverpool:* American white, per 480 pounds, 34*s.* to 34*s.* 6*d.*; ditto yellow, 32*s.* to 32*s.* 9*d.*; mixed, 32*s.* to 32*s.* 6*d.*; Danubian, 31*s.* to 32*s.* 6*d.*; Galatz, 32*s.* 6*d.* to 33*s.*

WOOL.—At the close of September the London wool market showed no feature of importance. Business had not been brisk, but prices had been steady. Southdown hoggets, 1*s.* 7½*d.* to 1*s.* 8½*d.* per pound; half-breed ditto, 1*s.* 9*d.* to 1*s.* 9½*d.*; Kent fleeces, 1*s.* 8d. to 1*s.* 9*d.*; Southdown ewes and wethers, 1*s.* 4½*d.* to 1*s.* 5*d.*; Leicester ditto, 1*s.* 8*d.* to 1*s.* 9½*d.* The fourth series of London sales of colonial wool was to commence October 2 and continue till October 25. About 100,000 bales constituted the aggregate receipts available for disposal. The Australian contributions were quite small. Cape supplies, however, were unexpectedly large, and forwarded with unusual promptness. A slight fall in Buenos Ayres wool was reported at Antwerp, and the present low prices indicate considerable permanence.

LIVE STOCK.—The total imports of foreign stock into London during the week ending September 27 amounted to 15,334 head of all descriptions, against 14,589 in 1872, 19,308 in 1871, and 12,459 in 1870. Prices were as follows: Coarse, inferior beasts, 4*s.* 6*d.* to 5*s.* per 8 pounds, to sink the offal; second quality, 5*s.* 2*d.* to 5*s.* 6*d.*; prime large oxen, 5*s.* 10*d.* to 6*s.* 2*d.*; prime Scots, shorthorns, &c., 6*s.* 2*d.* to 6*s.* 4*d.*; coarse, inferior sheep, 4*s.* 6*d.* to 5*s.*; second quality, 5*s.* 2*d.* to 5*s.* 8*d.*; prime coarse wooled, 6*s.* to 6*s.* 4*d.*; prime Southdown, 6*s.* 6*d.* to 6*s.* 10*d.*; large hogs, 4*s.* 2*d.* to 4*s.* 6*d.*; small porkers, 5*s.* to 5*s.* 4*d.*

MONTHLY REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR

NOVEMBER AND DECEMBER, 1873.

WASHINGTON:
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1873.

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MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
Statistical Division, November 25, 1873.

SIR: I herewith communicate for publication a digest of the November returns, showing the comparative production of corn, cotton, hay, potatoes, and other crops, with extracts from regular correspondence, tables of current prices of certain farm products, statistics illustrating the condition of agriculture in several European countries, and matter pertaining to the operations of the several divisions of the Department.

J. R. DODGE,
Statistician.

Hon. FREDERICK WATTS,
Commissioner.

DIGEST OF CROP RETURNS.

CORN.

The November returns do not materially change the corn prospect as indicated in October. This crop is so generally grown, its importance so great in the farm economy, that the reports are not only numerous, but more accurate than local estimates of the minor crops can be, and may be relied on as approximating closely the actual fact—possibly not so closely as census returns, perhaps in some cases a greater approach to accuracy. The so-called failure in 1869 was indicated before the crop was ripe. Instead of eleven hundred millions of bushels, or even ten hundred, the estimates footed up but eight hundred and seventy-four; and a large amount of soft corn was subsequently fed as forage, and not counted as corn gathered in the census. The gathered corn reported in the census was seven hundred and sixty millions of bushels, an aggregate actually less by seventy-eight millions than the crop of 1859, reported ten years previously. The *estimate* was not a bushel higher than the actual amount of corn in the fields at the time, including the soft corn, not of equal value, but utilized for feeding purposes. There was a good corn-crop in 1870, and the estimate was two hundred and twenty millions higher than that of 1869. The present returns indicate another "failure" in the exaggerated language of crop conversation and random crop reporting—a reduction of two hundred and thirty-three millions from that of last year. The per centage of the previous crop is 78. This gives eight hundred and fifty-eight million bushels. Only six States appear to have as much corn as in 1869,

viz, Virginia, West Virginia, Georgia, Florida, Oregon, and Rhode Island. The reduction in the principal corn-growing States is made as follows: Kentucky, 4 per cent.; Ohio, 11; Michigan, 17; Indiana, 22; Illinois, 29; Wisconsin, 13; Minnesota, 10; Iowa, 28; Missouri, 32; Kansas, 31; Nebraska, 40. Last year's estimate for Illinois was two hundred and seventeen millions; the present, one hundred and thirty-two millions—a difference of eighty-five millions. The percentages in the following principal counties, each of which produces from one to five millions in an average season, are: Montgomery, 33; Mason, 40; Adams, Bureau, De Witt, Moultrie, Piatt, Stevenson, Vermillion, 50; Mercer, 55; Cass, Lee, Marshall, Whitesides, Winnebago, 60; Hancock, Knox, Tazewell, 65; Ogle, 66; Edgar, Pike, Warren, 70; Sangamon, 72; Car-Douglas, roll, McHenry, Marion, Wayne, 75; Henry, Macon, 80; Starke, Saint Clair, 90; Madison, 100.

The reduction is heavy also in Iowa; the following counties, which count by millions of bushels, returning percentages as follows: Fremont, Marion, 50; Benton, Jefferson, Mills, 60; Tama, 65; Madison, 70; Clinton, Jones, Mehaska, 75; Iowa, Lee, 80; Jackson, 85; Linn, 90.

The percentage for New York is 92; for Pennsylvania, 84; Tennessee, 91; Mississippi, 85; Arkansas, 90; Texas, 75. Nebraska gives the lowest percentage; Florida the highest. A classification of the counties show that, of 983 represented, 652 return smaller products than those of 1872; 185 larger, and 146 the same as last year, as follows:

States.	Number of counties reporting above average.	Number of counties reporting average.	Number of counties reporting below average.	Total number of counties reporting.
Maine	----------	----------	9	9
New Hampshire	----------	5	3	8
Vermont	1	3	7	11
Massachusetts	1	3	3	7
Rhode Island	1	2	----------	3
Connecticut	----------	1	4	5
New York	8	6	27	41
New Jersey	4	1	8	13
Pennsylvania	3	6	29	38
Delaware	----------	----------	1	1
Maryland	4	----------	6	10
Virginia	27	8	19	54
North Carolina	12	9	30	51
South Carolina	2	----------	13	15
Georgia	16	14	17	47
Florida	11	3	----------	14
Alabama	12	5	10	27
Mississippi	3	6	12	21
Louisiana	7	3	8	18
Texas	5	6	38	49
Arkansas	8	3	15	26
Tennessee	8	8	37	53
West Virginia	11	9	8	28
Kentucky	10	6	25	41
Ohio	5	5	37	47
Michigan	3	4	24	31
Indiana	6	3	29	38
Illinois	1	3	51	55
Wisconsin	2	2	19	23
Minnesota	3	5	12	20
Iowa	1	1	49	51
Missouri	2	3	58	63
Kansas	1	3	22	26
Nebraska	1	2	13	16
California	1	7	7	15
Oregon	5	1	2	8
Total	185	146	652	983

The quality of corn is reported poorer than last year in nearly all the States, the only exceptions being Massachusetts, Virginia, Florida,

Alabama, and California. The Western States give the lowest figures: Iowa, 83, (a depreciation on the whole crop of last year of one-sixth;) Illinois, 85; Indiana, 88; Ohio, 85; Missouri, 79; Kansas, 79; Nebraska, 76. Other States do not exhibit a depreciation of more than ten per cent., except Pennsylvania, which is reported at 86. The prevailing characteristics of the season have been a wet spring, a summer too dry and short, early frosts, in many places cool rains in early autumn. The early-planted corn ripened well; much of the late-planted was immature when frost came, some of it so soft as to be of little value after thorough freezing. That portion of the early-planted which was deficient in drainage, either natural or artificial, was either "drowned out" or injured in its vitality and subsequent growth.

The winter set in too early for the in-gathering, one county in Wisconsin having twelve inches of snow when only a third of the crop had been harvested. The losses always apparent through insufficient or inefficient culture are doubly manifest in a season like this. Indications of this fact are everywhere observable in such remarks as these: "Intelligent cultivation has produced good crops;" "Crops shortened one-fourth by bad culture;" "Corn culture is declining through a lack of rotation."

The following extracts should not be deemed the substance of our own reports, as it would be a monotonous and interminable task to write or read all the volunteer remarks appended to the systematic returns intended for tabulation. They are only specimens selected with reference to peculiarities of local reports:

MAINE.—*Waldo:* Corn was badly injured by drought and the corn-worm. *Oxford:* Injured by frost; quality poor. Sweet-corn is becoming quite a farm product. A large canning establishment absorbs the product of an area fifteen miles square. Another establishment is in operation just across the line of Cumberland County. *Piscataquis:* Shortened by cold season and killed by frost before ripening. *Androscoggin:* Cold, late planting-season prevented its filling, but what did fill ripened well in October. *Sagadahoc:* Cold, wet spring rendered the crop very inferior. *Cumberland:* Shortened one-tenth by cold, wet spring and dry summer. Half the crop is sweet-corn, of which there were manufactured 3,000,000 cans, netting the farmers $135,000.

NEW HAMPSHIRE.—*Hillsborough:* About average. *Carroll:* Fodder plenty.

VERMONT.—*Lamoille:* Retarded by cold August and damaged by frost in September. *Rutland:* Injured by June drought. *Essex:* Slightly frosted; one-tenth spoiled. *Franklin:* Good, though late; not frosted. *Orleans:* Injured by frost early in September; large proportion of soft corn.

MASSACHUSETTS.—*Berkshire:* Corn mostly confined to the valley towns; crop average; sweet-corn culture enlarging. *Norfolk:* Yield reduced by drought in spring and early summer; quality good.

NEW YORK.—*Yates:* Short crop; unfavorable planting season. *Seneca:* About average. *Oneida:* Uneven; suffered from June drought. *Warren:* Frost too early for corn, much of which had been replanted. *Chemung:* Some pieces good, but the general average is low. *Washington:* Late, and injured by frost. *Erie:* Early plantings injured by cut-worms; some fields destroyed. Adam's Early, from the Department, was not so early as the common eight-rowed corn. *Rockland:* Very uneven; dry planting season. *Genesee:* Very uneven; some fine pieces and many poor ones; very fine where early planted in good soil and uninjured by worms. *Ontario:* Came up unevenly; yield inferior; first frost October 25. *Wyoming:* The corn season lengthened greatly, benefiting the crop. Early Huntington has ripened well, making good soft meal for cooking, but its ears are short and its yield is less than our common corn. *Columbia:* Good, and well harvested. *Otsego:* Shortened by cool summer and early frost. *Allegany:* Did not germinate well after replanting. *Sullivan:* Injured by frost.

NEW JERSEY.—*Atlantic:* Unusually good; abundant rains since August. *Sussex:* Not so good as last year; the ear-ends are bare of grain to a greater extent than usual. *Gloucester:* Late ripened but no injury from frost; first killing frost October 26. *Mercer:* Late planted and injured by June drought and September storm, but not by frost. *Burlington:* Good ripening season. *Warren:* Shorter than was anticipated. *Union:* Sound and ready for market. *Hudson:* Yield better than was anticipated; ripened before frost. *Hunterdon:* First killing frost October 28, the latest ever known here.

PENNSYLVANIA.—*Franklin:* Corn matured better than was expected; no serious

frost till October 29. *Centre:* Crop light; much did not mature. *Erie:* Late and much injured by September frosts. *Clinton:* Corn from first planting superior. *Northumberland:* Average yield and quality. *Wyoming:* Poorest crop in fifteen years badly frosted. *Northampton:* Early plantings 20 per cent. above last year; late plantings 20 per cent. below; average about the same as last year. *Elk:* Much unsound corn on account of replanting. *Beaver:* Husking delayed by stormy weather; much soft corn. *Lawrence:* Early frosts made much soft corn. *Fayette:* Crop short; cut-worms and poor seed. *Armstrong:* Softened by early frosts. *Lehigh:* Yellow corn ripened tolerably; gourd-seed not so well; much of it soft. *Jefferson:* Very good in quantity and quality; not injured by frost. *Lycoming:* Acreage about the same as last year but yield less. *Bucks:* Light crop. *Lancaster:* Reduced 20 per cent. below average by poor planting season. My lot of 20 acres produced 1,500 bushels. *Westmoreland:* Injured by early frosts.

DELAWARE.—*Kent:* Late plantings did well; early plantings injured by drought.

MARYLAND.—*Howard:* Late favorable weather has partially repaired the damages of cut-worms, late planting, and drought. *Dorchester:* Shortened by drought but of good quality. *Carroll:* Good except when worms destroyed the plantings. Some crops yield 90 to 100 bushels per acre. *Queen Anne's:* Crop lighter than was supposed. *Baltimore:* Crop fair. *Washington:* Largest crop ever made, in spite of drawbacks.

VIRGINIA.—*King and Queen:* Improved by late summer rains. *Prince William:* Cut-worms and weather made a late stand, but frost did not reach it. *Madison:* Yield above average; quality prime. *Rappahannock:* Not so good as last reported; not well filled, owing to excessive rains and cloudy weather. *Northampton:* Better than was expected. *Rockingham:* A fine season has repaired the damage of the cut-worm. *Spottsylvania:* Quality superior; yield 20 per cent. above last year's; Pennsylvania Yellow a success. *Fluvanna:* Full crop and in good order. *Pittsylvania:* Never recovered from the July drought. *Pulaski:* Matured well. *Loudoun:* Although the season was favorable the crop did not harvest so well as was expected; probably below average, though 10 per cent. above last year's. *Middlesex:* Best crop for four years. *Louisa:* Average. *Fauquier:* Fine season; even late plantings ripened. *Rockbridge:* Heavy crop. *James City:* This year has shown the value of early plantings. *Chesterfield:* Large acreage and yield, but not of good quality; frosted. *Bland:* Injured by grub-worms. *Henrico:* Below average, but 50 per cent. above last year's; affected by July drought. *Mecklenburgh:* Shortened by rains in planting-time, by floods on flat lands; later plantings injured by drought and chinch-bug. *Orange:* Season too dry for corn. *Northumberland:* Corn injured by drought and hail-stones. *Sussex:* Acreage increased 20 per cent., and quality as good as last year. *Page:* Full average and good quality. *Goochland:* Better than for years, though bottom plantings were injured by freshets; the increased upland yield will make the entire crop 20 per cent. greater than last year. *Cumberland:* Very fine. *King George:* Good crop; better than last year. *Highland:* Injured by worms; skunks destroy these worms. *Floyd:* Injured by drought and worms. *Clarke:* Yield double last year's; sufficient rain, but not quite enough heat; crop average. *Bath:* Light. *Dinwiddie:* Fine season and increased yield.

NORTH CAROLINA.—*Stokes:* Stand late and poor; did not escape frost; yield 70 per cent. of last year, and not of so good quality. *Rutherford:* Injured by excessive rain. *Stanly:* More abundant than last year, but no better; injured by excessive rains and floods; much rotten corn. *Person:* Greatly shortened by drought. *Chowan:* Crop short. *Craven:* Average increase 10 per cent.; yield per acre equal to last year's, and quality better. *McDowell:* Shortened by late planting and wet season. *Tyrrel:* Average. *Beaufort:* Injured by rains. *Lenoir:* Fair. *Gaston:* Good, but not equal to expectations. *Forsyth:* Fine; 50 cents per bushel. *Franklin:* Average where well cultivated. *Yadkin:* Short. *Davidson:* Abundant through late rains. *Greene:* Short 25 per cent. *Granville:* Damaged by June drought and July rains. *Haywood:* Yield equal to last year's; injured by rain and loose on the cob. *Rowan:* Not so heavy as last year. *Currituck:* Shortened by wet and increased cotton-culture. *Martin:* Above average and of good quality. *Perquimans:* Poor.

SOUTH CAROLINA.—*Williamsburgh:* A little below last year; too wet for cultivation. *Lexington:* Below last year in quantity and quality. *Georgetown:* Damaged by September rains, much of it rotting in the field. *Marlborough:* A considerable acreage was abandoned to grass on account of deficiency of labor. *Fairfield:* Bottom crops almost failures; upland better, but the aggregate yield is poor. *Newberry:* Bottom crops light and inferior. *Richland:* Shortened by wet; neglected for cotton. *Laurens:* Better and sounder than for ten years.

GEORGIA.—*Jackson:* Bottom crops injured by wet; upland crops fine where well cultivated. *Macon:* Gathers better than was expected. *Hart:* Good; equal to last year's. *Upson:* Twenty-five per cent. better than last year. *Towns:* Shortened by drought at silking. *Gwinnett:* Ten per cent. less than last year; quality as good. *Muscogee:* Below last year both in quantity and quality. *Oglethorpe:* Has not recovered from neglect in June. *Whitfield:* Full average, but remarkably small. *John-*

son: Damaged by excessive wet. *Dawson:* Bottom crops injured by rain; upland crops, well worked, are very fine. *Liberty:* Injured by rain.

FLORIDA.—*Hillsborough:* Crop housed in good order. *Taylor:* Better than ever known; Cooley corn from the Department a success. *Leon:* Crop large, but affected with rot. *Gadsden:* Full average and ten per cent. above last year. *Madison:* Greater quantity but lighter weight than last year. *Jackson:* Average quantity and nearly average in quality.

ALABAMA.—*Bullock:* Reduced ten per cent. below last year by wet spring, but the quality is better. *Lewiston:* Sixty per cent. of last year's crop. *Lawrence:* Varies from average to fifty per cent. below. *Crenshaw:* Equal to last year. *Clinch:* Better than last year, but below average. *Worth:* Good. *Blount:* Full average. *Pike:* Less than was expected; unusual proportion of rotten corn. *Saint Clair:* Sells at fifty cents per bushel. *Calhoun:* Fine in quantity and quality. *Clarke:* Better than last year. *Dallas:* Half crop; excessive rains prevented cultivation.

MISSISSIPPI.—*Lee:* Light but fine. *Jefferson:* Quality as good as last year, but yield less. *Hancock:* Did well. *Kemper:* Short. *Jones:* Better than was anticipated. *Jasper:* Injured by rain and grass. *Grenada:* Injured by spring rains, summer drought, and poor culture. *Winslow:* Pennsylvania Yellow successful; four weeks earlier than the ordinary varieties. *Wilkinson:* Rot and weevil injured the crops. *Tishemingo:* Sound. *Lowndes:* Short. *Rankin:* Much corn rotted on the stalk.

LOUISIANA.—*East Baton Rouge:* Almost a failure. *La Fourche:* Very short. *Iberia:* Corn $1 to $1.50 per barrel. *Rapides:* Very short; much rotten. *Franklin:* Considerable rot. *St. Mary:* A fourth of a crop and poor. *Assumption:* Failed through excessive rains.

TEXAS.—*Hamilton:* Turned out tolerably in spite of spring frosts and grasshoppers. *Bandera:* First two plantings destroyed by frost; the third injured by rain and worms; heavy frost October 20. *San Saba:* Inferior; late planted injured by insects and rotted. *Rusk:* Average. *Ellis:* The increased acreage will about counterbalance the decreased yield. *Cooke:* Very indifferent. *De Witt:* Damaged by wet; below average. *Harris:* Excessive growth of stalk and imperfect growth of ears; the increased acreage will bring up the yield to last year's. *Wood:* Injured by rot. *Coryell:* Not over 18 bushels per acre; less than last year. *Red River:* Smaller crop than was expected. *Collin:* Shortened by drought succeeding the heavy rains of May and June. *Milam:* Enough corn for home consumption. *Dallas:* Reduced by rains to three-fourths average. *Parker:* Shortened by grasshoppers in the spring, and by droughts afterward. *Upshur:* One-fourth short of last year; much rotten corn. *Kendall:* Poor. *McLennan:* Injured by May drought. *Burnett:* Poor yield; season unfavorable; hardly a fourth of the crop sound. *Kaufman:* Ten per cent. below last year; unfavorable season. *Cherokee:* Perhaps there will be a small surplus. *Lamar:* Wet spring caused the loss of a considerable acreage planted in corn; average yield decreased, but the total product equal to last year's. *Medina:* Product per acre and quality below last year. *Austin:* Light, and not equal to the home demand. Intelligent cultivation has produced good crops; prices 20 per cent. above last year's.

ARKANSAS.—*Fulton:* People scared at their short crops, but with careful feeding there is enough for home demand. *Franklin:* Short. *Perry:* Crop light, but supplemented by a heavy mast. *Boone:* Badly worm-eaten. *Baxter:* Shortened by drought. *Bradley:* Stands late and yield poor. *Arkansas:* Crop good and well secured. *Cross:* Below average, but better than last year. *Garland:* Planted largely, but shortened by drought. *Crittenden:* Short acreage and product. *Madison:* Rotted by August rains.

TENNESSEE.—*Dickson:* Gathers better than was expected; quality good. *Fentress:* Equal to last year in yield and quality; where well cultivated the crop was above average. *Hickman:* Early corn good; later, shortened by drought. *Haywood:* Shortened one-fourth by bad cultivation. *Shelby:* Considerable rot. *Hancock:* Gray squirrels destroyed 10,000 bushels. *Obion:* Damaged by wet spring. *Wilson:* Damaged by drought. *Weakley:* Lightest crop ever grown here. *Dyer:* One-fourth short, but sound and well matured. *Grundy:* Corn-culture surely declining through lack of rotation. *Wilkinson:* Superior to last year. *Blount:* Good, though injured by the late drought. *Sumner:* Shortened by drought following excessive rains. *De Kalb:* Late corn damaged 10 per cent. by frost. *Lawrence:* About three-fourths of a crop; injured by drought. *Smith:* Not so good as was expected; early growing season unfavorable. *Truesdale:* Short of last year 25 per cent. *Putnam:* Average; quality below. *Carter:* Injured by June rains and subsequent drought; but still average, and of excellent quality. *Bradley:* Badly damaged by drought and grasshoppers. *Cannon:* Shortened by spring rains and summer drought. *Jackson:* Injured by summer rains. *Monroe:* Equal to last year. *Robertson:* Acreage the same as last year; stand irregular; cut-worms unusually troublesome; excessive rains; poor cultivation. *Montgomery:* Much rotten corn.

WEST VIRGINIA.—*Raleigh:* Excellent. *Grant:* Vast quantities of corn frosted; in Milbury district three-fourths of the fodder is ruined. *Jackson:* Average; the acreage

has not increased enough to bring up the aggregate product to last year's extraordinary yield. *Mercer:* Half of last year's aggregate product and not nearly so well matured. *Pleasant:* A good crop in spite of late plantings, excessive rain, and poor culture. *Marion:* Smaller than last year by 10 per cent.; quality poorer. *Mineral:* Unusual amount of soft corn; heavy freeze October 30. *Brooke:* Much replanted and consequently did not escape frost. *Jefferson:* Well matured and but little frosted. *Braxton:* Yield a little less than last year and not quite so good. *Morgan:* A very remarkable crop considering the drawbacks of the early season. *Harrison:* Good and in good condition. *Tyler:* Quality very good.

KENTUCKY.—*Hardin:* Less than was supposed. *Oldham:* Average and of good quality. *Jefferson:* Over average and well matured. *Laurel:* Wet June prevented plowing and the grass and weeds took the fields. *Nicholas:* Early crop injured by drought; late crop better than last year. *Lincoln:* Well matured and sound. *Spencer:* Greatly impaired by drought; frost with ice October 28. *Taylor:* Wet, early season prevented working the crop; drought then occurred and lasted till October, greatly reducing the yield. *Clinton:* Acreage and yield decreased. *McLean:* Drowned out in the bottoms, many fields being abandoned; on rolling land the season did not admit of good cultivation. *Graves:* Below average 5 per cent; May and June wet, followed by drought in July and August. *Logan:* Barely enough for home consumption. *Ohio:* Short and bad; freeze October 28. *Fayette:* Superior; none frosted; dry and sound. *Anderson:* Above average; good growing and gathering season. *Johnson:* Injured by drought. *Owsley:* Injured by wet and storms; much rotten corn. *Livingston:* Injured by spring floods and summer drought. *Jackson:* One-fourth below average; quality equal to last year's.

OHIO.—*Vinton:* Injured by rain and floods. *Fulton:* Late planting and dry summer; short crop. *Jackson:* Best crop for many years; quality good. *Medina:* Crop diminished by late planting, imperfect tillage, grasshoppers, and early frosts. *Coshocton:* Inferior; ripened prematurely and was frosted; poor harvest season. *Lorain:* Shortened by replanting, grasshoppers, and frost, September 20. *Crawford:* Frosted in September. *Delaware:* Very disappointing. *Geauga:* Injured by replanting, poor seed, grasshoppers, and September frosts. *Henry:* Unfavorable growing season and early frosts. *Wyandot:* Replanting and early frosts; much soft corn. *Lawrence:* Best crop for several years. *Hamilton:* Good on clay lands but poor on sandy soils. *Mercer:* Very light, and much not well matured. *Perry:* Increased acreage; crop far above average on high lands; injured by early frosts on some low lands, which reduces the average quality.

MICHIGAN.—*Shiawassee:* Mostly matured, but the fodder was badly injured by frosts. *Mason:* Shortened by summer drought. *Lapeer:* Generally good and well matured, though some fields had been replanted. *Calhoun:* Much damage from defective seed; decreased area. *Gratiot:* Had to be replanted, in some cases three times, which reduced the yield seriously. *Jackson:* Cold weather interferes with gathering corn. *Ottawa:* Too dry to fill well. *Oakland:* Fair; stalks excellent. *Oceana:* Greatly shortened by drought. *Antrim:* Injured by August drought. *Berrien:* Shortened by excessive drought, but of good quality. *Livingston:* Worst season and poorest crop ever known here; late planting, poor seed, and cut-worms.

INDIANA.—*Owen:* Half average; excessive rain, then drought, and then frost. *Marion:* Yield greatly shortened by late spring, decreased acreage, heavy rains, floods, &c. *Grant:* Half crop. *Noble:* Considerable soft corn. *Hendricks:* Very little damage from frost. *White:* Shortened by summer drought and September frost. *Miami:* Considerable soft corn; late cold spring and early fall frosts. *Montgomery:* Acreage reduced; plantings late, and some crops caught by frosts; much soft corn. *Ripley:* Good in some places; in others injured by late cold spring and by early fall frosts. *Gibson:* Early corn good; late plantings shortened by drought, chinch-bug, and frost. *Hamilton:* Not gathered, and will be injured by the prevailing weather. We like our own corn better than the Pennsylvania yellow. *Martin:* Shortened and depreciated in quality by the August drought. *Steuben:* Most of the corn unhusked. *Cass:* Shortened by late planting, drought, and early frosts. *Morgan:* Short and inferior. *Wells:* Unsound. *Brown:* Early plantings good and sound; late plantings caught by frost; light in the cob and chaffy. *Dearborn:* Early plantings good; late variable; some ruined by drought and others by chinch-bugs. *La Porte:* Yield equal to last year in quantity, but rather poorer in quality on account of drought. *Floyd:* Best crop for years; worth 45 cents per bushel in wagons. *Ohio:* Shortened by drought and chinches.

ILLINOIS.—*Kankakee:* Fair crop on high lands; on flat prairies late plantings were injured by drought and autumnal frosts. *Richland:* Shortened by unfavorable planting season and rainy harvest. *Madison:* Increased acreage will bring the crop up to last year's aggregate; crop late. *Pike:* Shortened by drought and chinches. *Whiteside:* Considerable soft corn; stock turned into the fields to eat it. *Tazewell:* September frosts made much short corn. *Macon:* First plantings well matured; late plantings, about two-thirds of the crop, will not do to crib, but are being fed to cattle and

hogs. *Putnam:* Many fields frosted. *Bureau:* Much soft corn. *Perry:* Early plantings did well; late plantings failed through drought. *Sangamon:* Early season wet; early fall frosts; crop a comparative failure. *Montgomery:* Late plantings badly frost-bitten, chaffy and loose on the cob. *Vermillion:* Half crop, and only half of that merchantable. *Winnebago:* Poor planting season and September frosts shortened the crop, yet it is mostly sound. *Cass:* Shortened by wet spring and dry summer. *Edwards:* Very fine. *Grundy:* Late planting reduced acreage and delayed the crop till frost came. *Mason:* Acreage and product greatly shortened. *Piatt:* Half a crop; much of it loose on the cob. *Boone:* Late planted, and hence caught by the frost of September 13. *Clinton:* Good corn season; large acreage; crop injured by chinches, late planting, and want of tillage. *Lee:* Quantity 40 per cent. and quality 10 per cent. below last year.

WISCONSIN.—*Richland:* Much corn unhusked and winter upon us. *Juneau:* Six inches of snow and much corn ungathered; ice 2 inches thick. *Greene:* Badly frosted. *Adams:* Injured by hot, dry summer. *Calumet:* Ripened well. *Dodge:* Reduced acreage; much replanted; early frosts prevented its ripening well; yield about 75 per cent. of an average. *Fond du Lac:* Shortened by drought while in the ear. *Walworth:* Early plantings average; late plantings injured by drought and frost. *Outagamie:* Two-thirds of the crop ungathered, and 12 inches of snow. *Green Lake:* Crop good and well matured, though injured by August drought.

MINNESOTA.—*Benton:* Secured before frost. *Steele:* Good, but not equal to last year's extra crop; acreage slightly increased. *McLeod:* Crops on low flat lands injured by cold, wet planting season; the season later was fine, and matured the crop well. Pennsylvania Yellow, from the Department, made a heavy crop; some stalks 14 feet high. *Carver:* Pennsylvania Yellow turned out heavily, but was a little late; probably too deeply planted. *Redwood:* Late spring made a light crop. *Houston:* Not half husked. *Martin:* Put back by wet spring and somewhat injured by grasshoppers; Dent varieties injured by early frosts. White Dent and Cherokee the best; Pennsylvania Yellow good. Corn, though much neglected, is one of our best crops, yielding from 60 to 125 bushels. *Isanti:* Ripened well; better quality than last year; Pennsylvania Yellow did not ripen well; not suitable to the latitude.

IOWA.—*Pocahontas:* Not so good as was expected. *Ringgold:* Injured by extreme summer drought. *Story:* Shortened by the backward spring and early frost. *Clinton:* Well ripened, but not yielding as well as was expected. *Clarke:* Badly injured by summer drought. *Decatur:* Best crop we ever raised. *Harrison:* Late planted and poorly cultivated; acreage smaller than even in 1872, the people giving special attention to wheat; summer drought and grasshoppers did much damage; quality inferior. *Mills:* Half of last year's crop. *Boone:* Damaged by early rains; deficiency equalized by increased acreage. *Appanoose:* Crop from 15 to 50 bushels per acre; early plantings best; bottom crops poorest; late corn light and chaffy. *Clayton:* Scarcer than for twenty years. *Fayette:* Injured by drought. *Floyd:* Not husking out as well as was expected. *Hardin:* Frost made much soft corn and loose on the cob. *Audubon:* Poorest crop in thirty years. *Tama:* Pennsylvania Yellow too late for this climate; yields 50 bushels; was frosted. *Benton:* Late plantings injured 15 per cent. by early frosts; early plantings average. *Plymouth:* Injured by grasshoppers. *Linn:* Well matured, and a fair average crop. *Des Moines:* Severely injured by the unprecedented drought; even wells have gone dry. *Jefferson:* Seriously damaged by drought. *Winneshiek:* Good corn scarce; selling at 40 to 50 cents per bushel, against 25 and 30 last year; acreage reduced; poor stand; early and repeated frosts. *Louisa:* Equal to last year, where early planted and well cultivated; some sandy soils will not return 5 bushels per acre. With last year's surplus there is an average supply of corn. *Marion:* Crops vary from one-third to two-thirds of last year's. *Guthrie:* Pennsylvania Yellow does well. *Calhoun:* Somewhat frosted. *Grundy:* Half crop. *Lee:* Pennsylvania Yellow yields 65 bushels per acre, 15 more than any other variety; ripens earlier.

MISSOURI.—*Gasconade:* Injured by chinches. *Polk:* Greatly injured by drought and chinches. *Caldwell:* Perhaps average on deep-plowed ground; late shallow plantings of no account except for fodder. *Audrain:* Wet spring reduced the acreage, subsequent drought cut short the yield 60 per cent. of an average and 50 per cent. of last year's crop, making the actual yield but 40 per cent. of an average. *Jasper:* Injured by drought and chinch-bugs. *Miller:* Cut down half by drought and chinches. *Platte:* Quarter of a crop, and inferior. *Holt:* Reduced by drought. *Clinton:* Very poor, injured by late planting, excessive rains in May, summer drought, and early frosts. *Harrison:* Shortened by drought but sound. *Clay:* Shortened by drought and grasshoppers. *Saint Clair:* Poor; cob soft; poor fodder. *Benton:* Greatly injured by long-continued drought. *Baxter:* Very light; quality inferior. *Douglass:* Light but good; late plantings injured by drought and chinches. *Potter:* Light and chaffy through drought. *Carter:* Lightest crop since 1854. *Texas:* Yield 20 per cent. below last year; injured by chinches. *Adair:* Two-thirds of a crop; quality inferior. *Howard:* Shortened by drought. *Montgomery:* Limited by wet spring and subsequent drought. *Perry:* Failure through drought and chinch-bugs. *Phelps:* Injured by

drought and chinch-bugs. *Carroll:* Not feeding well; light and chaffy; requires 50 per cent. more than last year. *Cass:* Injured by drought. *Franklin:* Bottom crops good; upland below average. *Morris:* Damaged by chinch-bugs after severe drought. *Laclede:* About 50 per cent. short. *Dallas:* Cut short by drought and chinches. *Newton:* Shortened by drought and chinch-bugs. *Cole:* Shortened by drought and chinches, in some cases one-half. *Pemiscot:* Neglected for cotton. Pennsylvania Yellow from the Department was very early, but the ears were too small for field-corn.

KANSAS.—*Miami:* Drought following spring rains greatly shortened the crop. *Nemaha:* Shortened by drought, but with 30 per cent. of last year's crop on hand there will be a surplus. *Clay:* Much injured by drought; early frosts. *Bourbon:* Less than was expected. *Shawnee:* Early bottom-crops good; late hill-crops a failure. *Jefferson:* Shortened by drought following excessive rains; fodder unusually good and abundant. *Labette:* Increased acreage, but crop shortened by drought and chinches. *Linn:* Forepart of the season wet, preventing the working of crop; much late planted. *Montgomery:* Badly damaged by chinch-bugs. *Woodson:* Injured by chinches. *Coffey:* Light but sound; much old corn on hand; price 30 to 35 cents per bushel. *Republic:* Good and sound, with thorough cultivation. *Cowley:* Early plantings sound, firm, and solid; late plantings light and chaffy. *Osage:* Quantity deficient; quality good; nearly all plantings after May 1 are worthless. *Smith:* Damaged by grasshoppers. *Wilson:* Nearly destroyed by chinches on the uplands. *Riley:* Severely shortened by drought. *Neosho:* Injured by drought and chinches. *Cherokee:* Acreage decreased 10 per cent.; yield 25 per cent.; quality 15 per cent. below average.

NEBRASKA.—*Johnson:* Half average. *Wayne:* Late through wet spring, and shortened by drought. *Pawnee:* Shortened three-fifths by drought. *Webster:* Injured by rain in planting time. *Antelope:* Harvesting very fair; acreage largely increased, but early frosts reduced the quality 20 per cent. *Nemaha:* Seriously affected by drought in the eastern part of the State, and by grasshoppers in the western part. *Cass:* Much lighter than was expected. *Otoe:* Drought since June; corn greatly reduced in quantity and quality.

CALIFORNIA.—*Alameda:* Ripened finely.

OREGON.—*Curry:* Adams Early corn ripened six weeks before any other; promises to be the most valuable variety on the Pacific coast.

COLORADO.—*El Paso:* Matured well; produced 40 bushels per acre at an elevation of 6,000 feet above sea-level; one field in Pueblo County averaged 78.26 bushels per acre.

UTAH.—*Kane:* Larger crop than last year, but more injured by grub in the ear, especially late crop. *Weber:* Excellent. *San Pete:* Season too cold for ripening; Pennsylvania Yellow frosted in the milk.

DAKOTA.—*Clay:* Very light; grasshoppers.

IDAHO.—*Ada:* Injured by September frosts.

ARIZONA.—*Yavapai:* Increased by late rains.

NEW MEXICO.—*Mora:* Crop backward through drought; some frosted. *Doña Ana:* Shortened by lack of moisture. *Santa Ana:* Much of this crop yet green.

COTTON.

The following answer to an inquiry frequently made by persons who have not examined carefully the wording of our schedules, may serve to correct any misapprehension that may have arisen from a superficial reading of these reports:

In answer to yours asking "what constitutes an average cotton-crop according to the reports of the Agricultural Bureau," I suppose you refer to the returns by our statistical corps of the *condition* of the growing crop, for example, "average condition October 1" for each State respectively. It is not an estimate of the quantity of fiber that will be gathered, but it is simply a report of the comparative "condition," the state of development, vitality, and healthfulness of the plant, the standard of comparison being 100, the unit representing a normal or "average" development. It is the universal and only practicable mode of reporting the status of a growing crop not yet fruited, and subject to a thousand vicissitudes. As a farmer remarks of his wheat, that it will be one-third short of a fair crop; of his corn, that it will be 10 per cent. better than usual; as a newspaper reporter says of the hay-crop of a neighborhood, that it will only average three-fourths of a crop, so our correspondents, writing from different points which have soils of differing capacities, report the comparative vigor and development of a crop, with reference to a normal or average condition of health and vigor, which, if continued, would give ultimately an average crop.

In November our returns are not of condition, but a direct estimate of the total quantity produced in each county in comparison with the crop of last year.

The insatiate desire of Americans to discount the future and calculate from the

opening of a flower in June the quantity and value of its fruitage in October, leads to the expectation of many an absurdity; and it is frequently the case that a positive prediction of the aggregate quantity of cotton is deduced from our summer reports of ever-changing condition, and as the changes of the season occur, floods devastate, worms destroy, the Department is held rigidly responsible for absurd deductions from the truthful record of June or July.

The weather has been generally favorable for cotton-picking during the past month, as well as for ripening of the later bolls. Some of the reports are exceptionally favorable. In the more northern portion of the cotton-belt fields that were planted late were caught by the frost, but the area thus injured has nowhere been large. Low temperature in spring caused a slow growth in the uplands of Carolina, and in some instances a failure to mature. Florida has continued to report disastrous storms and destruction by the caterpillar. In some cases, in which the plant had "run to weed," the presence of worms that appeared late has been considered an advantage, arresting growth and tending to more rapid opening of nearly developed bolls. In the Gulf States there were few frosts until November, though one of some severity is reported in Bossier Parish, Louisiana, on the 28th ultimo. A circular has been sent out to ascertain the date of the first killing frost in each county, in connection with the average time of recurrence of such frosts for a series of years, and also the date of commencement of picking, which will be the subject of a later report. The November returns make mention of little yellow or stained cotton, many of them indicating superior quality in the fiber. More complete and systematic information on this point will also be included in the next report. In the entomologist's department of this issue will be found a result of the investigation relative to the best means of destroying cotton-insects.

Good reports of the "Peeler" cotton are made, yields of 1,600 pounds of seed-cotton being frequent.

Unlike the returns of previous months, which relate to comparative condition without reference to area, those of November make a direct comparison of the aggregate amount of cotton grown in each county with that produced in the previous year. Our correspondents have thus estimated the production of a large portion of the cotton area. Not only are these estimates in accordance with the general tenor of previous reports, but they are in essential harmony with those of cotton associations which make systematic statistical collections, except that they are somewhat higher, as usual, but probably not too high, as they have rarely ever exceeded the actual result.

We make the product compared with last year, expressed as a percentage, as follows: North Carolina, 98; South Carolina, 92; Georgia, 97; Florida, 97; Alabama, 91; Mississippi, 85; Louisiana, 80; Texas, 112; Arkansas, 102; Tennessee, 102. In view of the marked increase in area in most of the States, these figures indicate a crop considerably less than an average. A careful recanvassing of the question of area gives 9,509,524 acres in the ten cotton States, against 8,482,905 in 1872, an increase of 1,026,619 acres, or 12 per cent. The increase of area in the several States appears as follows: North Carolina, 14 per cent.; South Carolina, 10; Georgia, 11; Florida, 6; Alabama, 8; Mississippi, 11; Louisiana, 10; Texas, 20; Arkansas, 17; Tennessee, 15. Commercial authorities in cotton matters have been in the habit, for several years, of including two or three hundred thousand acres in more northern States, nine-tenths of which are a myth, based on an attempted planting on a large scale in years of cotton scarcity, an effort which has been discontinued by the planters, as its record has also been in these reports. The census only reported 3,148 bales in Missouri, Ken-

tucky, Virginia, Illinois, Kansas, Nevada, California, and other Northern States. While this is by no means a complete enumeration, the amount is still small notwithstanding a reported increase in Missouri and California.

The following table presents a statement of the census crop of 3,000,000 bales, an estimate by States of the crop of last year, which is shown by the cotton movement to have been about 30 per cent. larger than that of 1869, and the yield indicated by the November returns of the present year, with the estimated area and yield per acre:

States.	Yield in 1869. (Census.)	Yield in 1872. (Estimated.)	Yield indicated by November returns.	Number of acres.	Yield per acre.
	Bales.	*Bales.*	*Bales.*		*Pounds.*
North Carolina	144, 935	180, 000	176, 400	513, 717	159
South Carolina	224, 500	276, 000	253, 920	627, 717	188
Georgia	473, 934	595, 000	577, 150	1, 455, 577	184
Florida	39, 789	47, 000	45, 590	167, 584	126
Alabama	429, 482	535, 000	486, 850	1, 499, 009	151
Mississippi	564, 938	744, 000	632, 400	1, 706, 755	172
Louisiana	350, 832	501, 000	400, 800	1, 034, 239	180
Texas	350, 628	467, 000	523, 040	1, 097, 122	221
Arkansas	247, 968	335, 000	341, 700	811, 409	195
Tennessee	181, 842	240, 000	244, 800	596, 395	190
Total	3, 008, 848	3, 920, 000	3, 682, 650	9, 509, 524	

This aggregate, with the small quantity grown outside of the limits of the cotton States, will make the total estimate of the November returns, as nearly as possible, three million seven hundred thousand bales. As the weather and other circumstances continue to affect the ultimate outcome of the crop, in the more southern and larger States, until Christmas, the result may yet be modified by an exceptionally favorable season in the latter part of November and in December, on the one side, or by storms affecting injuriously the saving of the crop on the other. Low prices and scarcity of pickers may cause a remnant of the crop to be left in the field, as some correspondents have already suggested.

The yield per acre is much lower than usual in Alabama, Mississippi, and Louisiana. The average is always comparatively high in the latter State, the cotton acreage being almost exclusively on productive lands. This is also true of a large proportion of the cotton-fields of Arkansas. Mississippi gives a high rate of yield in the river counties, on the Yazoo and Big Black, and in the rotten-limestone lands of Hinds and Madison; but the counties of Eastern and Southern Mississippi, large in total area, but not in cotton acreage, make smaller yields and reduce the general average. In Texas the yields have always been reported high because cotton is generally planted on very productive soils, of which there is yet an abundant supply for selection.

VIRGINIA.—*Sussex:* Cotton-crop will be 50 per cent. greater than last year; a worm, heretofore unknown, stripped the leaves just before the cool nights of October. *Surrey:* Has opened well, and promises a good yield of good quality. *Greenville:* Shipped about 4,000 bales. *Dinwiddie:* Increase in acreage 30 per cent.; decreased yield per acre 10 per cent.; rain caused dropping of forms and rust. The quality of lint is good.

NORTH CAROLINA.—*Rutherford:* Yield and acreage 50 per cent. above average; quality very good. *Stanley:* Crop has grown well, but there is a lack of labor to save it; much will necessarily be left to destruction. *Chowan:* Shortened by rain and worms.

Hamett: Crop reduced to an average by wet. *Catawba:* Increased acreage will about make up deficiency in yield. *Craven:* Increased acreage will bring a deficient crop up to average. *Pitt:* Top crops taken by worms; boll-worm injurious; crop marketed early through necessity. *Tyrrell:* Below average; unpropitious season and caterpillars. *Beaufort:* Shortened by wet and caterpillars; fields that were expected to turn out 1,000 pounds per acre are realizing but 500 to 600; caterpillars saved the top-crop from the frost. *Alamance:* Plants had a fine stalk, but the season was too wet for their maturity. *Lenoir:* Short 10 per cent. *Gaston:* Satisfactory; yield of lint fair; frost October 20; damage not known. *Franklin:* Increased acreage will bring the crop up to last year's, or nearly so. *Davidson:* Late spring frosts kept back the crop too late to mature well. *Greene:* Low prices do not justify more than 40 cents per hundred for picking, a rate which does not attract laborers; yield a third below average and 25 per cent. below last year. *Granville:* Acreage three times that of last year; lint very good. *Haywood:* Did not mature well on the high table-lands. *Rowan:* Attacked by army-worms October 5 and stripped; opened unusually early. *Currituck:* Prospect good till the army-worm came. *Pamlico:* Army-worms have reduced a crop promising 20 per cent. increase to last year's standard; rain and rust also injurious as well as the money panic. *Northampton:* Good weather has opened the crop more freely of late; second picking good. *Martin:* Yield small; quality good. *Perquimons:* Half crop in yield, but increased acreage will carry it to 70 per cent. probably; cotton won't pay at less than 15 cents per pound.

South Carolina.—*Edgefield:* Season fine for picking. *Williamsburgh:* Miserably poor; half of last year's crop will not pay cost. *Lexington:* Below last year; ran to weed, and was afterward eaten by worms. *Georgetown:* "Santee grades," approximating long staple or sea island, have done well. Short staples have also proved remunerative. *Marion:* Overrun by grass in the spring and early summer; stripped by caterpillars on the more improved lands. *Marlborough:* Injured by frosts and worms, but the yield probably equal to last year's. *Newberry:* Better than was expected; much rust in gray lands. *Barnwell:* Will average about 475 pounds of seed-cotton per acre. *Richland:* Hardly equal to last year. *Laurens:* Four-fifths will average middling; very little yellow cotton.

Georgia.—*Jackson:* Late fall and fair weather will bring an average crop. *Putnam:* Late cotton taken by caterpillars. *Twiggs:* The most disastrous cotton year since 1840. *Stewart:* Shortened one-half by wet and worms. *Macon:* Falling price, and product very discouraging. *Hall:* Best picking season yet known. *Floyd:* Injured slightly by late killing frosts, the top-crop having been swept by caterpillars; fine picking season. *Fulton:* Yield unexpectedly large; lint fine; good fall season; picking will be finished a month earlier than usual; half the crop sold. *Spalding:* Quality 20 per cent. better than last year; fine picking season. *Hart:* Increased acreage will bring the crop to last year's average. *Walton:* Season unusually favorable for maturing and gathering the crop; increased acreage will balance the decreased yield. *Taylor:* Acreage increased 10 per cent.; worms nearly ruined the crop. *Dooly:* Cotton a failure, but the "Peeler" has done well; it should be planted very early. *Schley:* Short crop; will be picked by November 10. *Upson:* About 15 per cent. better than last year, yielding 125 pounds of lint per acre; some lands reach 1,000 pounds, and others sink to 75. *Wilkes:* Remarkably good picking season; frosts injure late cotton, but the exposed area is not large; labor scarce and unreliable. *Gwinnett:* Fine season; crop equal to last year, though the weed is not so large; mostly picked without rain or stain. *Muscogee:* Shortened by caterpillars. *Marion:* Shortened by caterpillars. *Oglethorpe:* Below last year; excessive early summer rains; shedding; early frosts, &c. *Whitfield:* Good; nearly all picked. *Richmond:* Lint on strong red lands may average 250 pounds; on gray lands not over 100. *Johnson:* Cut off to some extent by caterpillars. *Dawson:* Average increased; Peeler from the Department is large, well bolled, and yields good lint, but it is late. Picking season fine. *Carroll:* Fine picking season; heavy frost October 19. *Liberty:* Injured by rain. *Murray:* Lint fine; 1¼ pounds lint to every 3 pounds seed-cotton.

Florida.—*Manatee:* Much injured by storm October 6. *Hillsborough:* A little injured by rain. *Taylor:* Caterpillars have nearly stopped cotton-culture. *Jefferson:* Caterpillars had stripped the leaves, permitting the late storm to blow out the lint badly, reducing the yield very greatly. *Gadsden:* Reduced by the storm of September 19 to half an average, and one-fourth below last year. *Wakulla:* Ten per cent. above last year in spite of caterpillars and the September gale; a few unsuccessful experiments with Paris green. *Madison:* Reduced by storms. *Jackson:* One hundred pounds seed-cotton yield 31 of lint. *Putnam:* Black-seed or long-staple cotton is a money-crop in the western part of the county.

Alabama.—*Bullock:* Better than usual. *Perry:* Below expectations. *Lewiston:* Little over a half crop; quality better than usual; picking early. *Lawrence:* Probably below average. *Chambers:* Caterpillars ruined the top-crop and did other damage. *Crenshaw:* Fair crop; 1 bale of lint to 3 acres. *Choctaw:* Shortened by caterpillars. *Clinch:* Cut down one-half by wet weather and caterpillars. *Worth:* Shortened by

rust and caterpillars; cotton-culture very unpromising. *Blount:* Best crop ever produced here; caterpillars ate the leaves, but this only hastened the ripening of the bolls; fine picking weather. *Pike:* Less than expected; seed injured by ravages of worms on the stalks. *Saint Clair:* Peeler cotton on good uplands produces 1,400 pounds of seed-cotton per acre. *Coffee:* Good season; late cotton injured by caterpillars; crop 25 per cent. better than last year. *Wilcox:* Half crop. *Montgomery:* Unprecedented falling off; picking time good. *Conecuh:* About 150 pounds lint per acre; slow marketing; holding up for better prices. *Franklin:* Will sample better than last year. *Calhoun:* Injured by worms, but not nearly so bad as last year. *Talladega:* Shortened by caterpillars. *Dallas:* Considerable acreage stripped by caterpillars.

Mississippi.—*Lee:* Shortened by drought, caterpillars, and boll-worms; very few acres produced a bale. *Jefferson:* Short through worms and panic. *Hancock:* Staple fine. *Jones:* Better than was expected. *Pike:* Curtailed by rain, grass, and army and boll worms. *Jasper:* Shortened by caterpillars; marketed promptly. *Grenada:* Greatly injured by drought, rust, and worms, together with poor culture and inefficient labor. *Claiborne:* Full average. *Wilkinson:* Gathered very early. *Tishemingo:* Freer from dirt than usual. *Lowndes:* A failure. *Rankin:* Upland Peeler, on cow-penned land, produced 1,600 pounds per acre of seed-cotton; no better than other cotton beside it. *Bolivar:* Severe frost October 28; no top crop of consequence; caused by shallow plowing. *Clark:* Good picking season; worms took the top crop; first killing frost October 28; next night ice was formed half an inch thick.

Louisiana.—*Caddo:* Fall fine; most of the crop gathered; about half average. *Bossier:* Severe frost October 28, but most of the cotton had been saved. *Tensas:* Shortened by worms and rot—dry or black rot. This disease is unexplained. It prevailed in poor, worn-out soil; new or highly fertilized land was but little affected. *East Baton Rouge:* Half crop; fine picking season. *Morehouse:* Two-thirds of a crop; fair picking weather. *Claiborne:* Boll-worms still more destructive than caterpillars. *West Feliciana:* Ruined by worms. *Tangipahoa:* Short; first killing frost October 28. *Iberia:* No cotton coming to market. *Rapides:* Half last year's yield; staple short and stunted; much rot. *Franklin:* Lint averages about 180 pounds per acre. *Grimes:* Low prices have caused much of the crop to be left in the field. *Assumption:* Injured by rain and worms. *Corcordia:* Half crop.

Texas.—*Rusk:* About 25 per cent. below average. *Ellis:* Increased acreage will bring up the yield to 50 per cent. above last year's, if the whole crop should be gathered; it will all be gathered in November. *Brazoria:* Spring frosts, summer rains, and worms have about destroyed the crop. *Cooke:* Lint good; early frosts will damage the crop; thermometer showed 27° on the morning of October 29. *De Witt:* Fine west of the Guadaloupe, but the scarcity of labor causes great difficulty in getting the crop in. A large area has produced one bale of 500 pounds per acre. *Williamson:* Frost and ice October 28, killing one-fourth of the cotton. Difficult to get hands to pick cotton where poisons have been used to kill insects, and hence a few or no efforts of that kind have been made. *Montgomery:* On some farms, with a free use of Paris green, the crop turned out as high as 1,400 or 1,500 pounds per acre; on some pine and red-oak lands the yield was as low as 300, having been overrun with weeds. *Coryell:* Will average 300 pounds per acre; would have been a very large crop but for heavy rains. *Red River:* Opening finely in the nice weather. *Collin:* Season favorable for gathering cotton and for maturing late crops. *Milam:* Average, but below expectation. *Henderson:* More favorable than last report; three-fourths average; good picking season. *Dallas:* Fine; good harvest weather; lint of average quality. *Parker:* Yield 250 pounds per acre of lint; about the same as last year; acreage largely increased. *Upshur:* Short, but yields an unusual proportion of lint, 33⅓ per cent. *Caldwell:* Insects less injurious than was supposed; many crops yield over a bale per acre; lint better than for years. *Kendall:* Acreage largely increased; plants short, but bolls plentiful and remarkably clean. *McLennan:* Largest crop yet raised; reliable reports of 750 pounds of lint per acre; picking behindhand. *Laraca:* Excessive rains and worms; lack of labor to gather the crop and storms are beating a portion of it out; present system of cropping unsatisfactory. *Burnet:* Promises well, but there is a lack of pickers. *Matagorda:* But little cotton will be saved; lack of reliable labor in gathering; Peeler sustains its high character. *Lamar:* The wet spring caused a considerable acreage to be lost after planting. *Marion:* Better than was expected since the worms disappeared. *Medina:* Some damage by army-worms and rain. *Austin:* Crop late; where the worms were not destructive a heavy top-crop will require the whole month to pick.

Arkansas.—*Drew:* The money panic will prevent some farmers from gathering their crops. *Franklin:* Above average in quantity, but deficient in quality of lint. *Perry:* Recent freezes severe. *Baxter:* Early frosts have arrested the opening of cotton. *Bradley:* Below average, but quality better than last year; picking well advanced. *Prairie:* Better than was expected. *Arkansas:* Injured by drought in timber lands; good on bottoms. *Monroe:* Yield better than was anticipated; below

average, but better than last year. *Cross:* Not over 75 per cent. of an average: injured by spring rains and summer drought: *Craighead:* A gain in lint over last year. *Garland:* Shortened 15 per cent. in quantity and 30 per cent. in quality by drought and army-worms. *Hempstead:* Damaged greatly by worms; fiber generally short but sound and clean. *Crittenden:* Late and caught by frost. *Little River:* Damaged by wet spring; worms took the top-crop, cutting down the yield at least 10 per cent.

TENNESSEE.—*Lauderdale:* Not so good as was expected. *Haywood:* No top-crop; crop cut short a third by drought following excessive rains; 15,000 bales last year; middling now selling at 10 cents. *Shelby:* Damaged 50 per cent. by caterpillars and boll-worms. *Hancock:* Does well on sunny slopes and river-bottoms. *Obion:* Best crop for ten years. *Giles:* Fine gathering season. *Lincoln:* The yield will be larger than last reported; fine picking season. *Putnam:* Unusually good. *Fayette:* Cotton but two-thirds of a crop.

KENTUCKY.—*Graves:* Cotton culture increasing.

MISSOURI.—*Ripley:* Will market 500 bales against 200 last year. *Stoddard:* A little below average, but the large increase of acreage raises the aggregate yield to 120, as compared with last year. *Dallas:* Cotton culture increasing. *Pemiscot:* Three times the acreage of last year, but the yield per acre was below average; frost cut short the crop at least 10 per cent.

KANSAS.—*Labette:* Cotton quite a success in a small way. *Montgomery:* Cotton would pay if there were gins accessible.

POTATOES.

Our returns make the average product of potatoes throughout the country 15 per cent. less than last year. As the crop was then estimated 113,516,000 bushels, a falling off of about 17,000,000 bushels is indicated. The product equals that of 1872 in Delaware; exceeds it in New Hampshire, Virginia, Arkansas, and Oregon, 103; Vermont, 122; Massachusetts and Connecticut, 101; New Jersey and Georgia, 102; South Carolina, 104; Florida, 125; and Alabama, 116; is less in Maine, 82; Rhode Island, 90; New York, Pennsylvania, and Wisconsin, 95; Maryland and California, 96; North Carolina and Texas, 92; Mississippi, 99; Louisiana and Tennessee, 97; West Virginia, 93; Kentucky, 81; Ohio, 78; Indiana, 80; Illinois, 57; Minnesota, 75; Iowa and Nebraska, 40; Missouri, 58; Kansas, 46. The variations from last year's product in some of the principal potato-growing States are about as follows: Increase — Vermont, 918,000 bushels; decrease — New York, 1,187,000; Pennsylvania, 558,000; Kentucky, 408,000; Ohio, 1,705,000; Indiana, 560,000; Illinois, 4,157,000; Minnesota, 553,000; Iowa, 3,979,000; Missouri, 1,132,000; Kansas, 2,051,000; Nebraska, 575,000. In all sections the quality, except where affected with rot, is represented as superior. Among the causes of diminished product are specified: Maine, Waldo County, drought and frost; New York—Washington, Yates, Tioga, and Ontario, rot; Albany, drought; New Jersey—Hudson, drought; Mercer, drought and rot; Pennsylvania—Cumberland, Wyoming, Northampton, Lehigh, Bucks, and Lancaster, rot; Elk, Lawrence, Fayette, and Armstrong, beetles; Maryland—Dorchester and Baltimore, drought; Virginia—Orange, frost and drought; Highland, rot, worms, and beetles; Texas—Burnet, grasshoppers; Arkansas—Garland, beetles and rot; Tennessee—Dickson and Coffee, drought; Hickman, rot; West Virginia—Burleigh, Brooke, and Baxter, insects; Mongalia, rot; Kentucky—Shelby, drought; Anderson and Livingston, Colorado beetle; Ohio—Washington, Franklin, Medina, Loraine, Crawford, Geauga, Hamilton, and Mercer, Colorado beetles; Fulton, Henry, Wyandotte, and Mercer, drought; Michigan—Mason, drought; Ottawa and Oceana, drought and beetles; Calhoun, beetles; Indiana—Warren, and Brown, drought; Martin, Owen, and Ohio, drought and beetles; Illinois—Henry, drought; Tazewell, Mason, and Boone, drought and bugs; Clinton, bugs and wet; Sangamon, beetles; Cass

reports the lightest, and Knox the poorest, crop ever raised; Lee, almost a complete failure; Wisconsin—Washington, drought and beetles; Calumet and St. Croix, beetles; Richland reports that winter had set yet in, and Outagamie that the snow was a foot deep, and many fields not dug; Minnesota—Kandiyohi, drought and beetles; Redwood, drought and grasshoppers; Martin, grasshoppers; Iowa—Ringgold, Clarke, Montgomery, Boone, and Louisa, drought; Harrison, drought and grasshoppers; Fayette, Audubon, and Winneshiek, drought and beetles; Plymouth, grasshoppers; Story and Benton, early frosts; Missouri—Baxter, Perry, and Maries, drought; Pettis and Maries, beetles; Baxter, Adair, Laclede, and Stone report half a crop; Clinton one-fifth, and Anderson an entire failure; Kansas—Miami, Clay, Bourbon, Labette, and Montgomery, drought; Smith, beetles, worms, and grasshoppers; Nebraska—Pawnee and Nemaha, drought; Thayer, beetles and frost; throughout the three States last named early plantings appear to have produced much better in yield and quality than late. In California—San Luis Obispo, the crop was greatly injured by grasshoppers, and in Oregon, Tillamook, by blight. Returns from the Territories are generally favorable, but Deer Lodge, Montana, reports one-third of the crop frozen in the ground in September, and in Clallam, Washington, the rot had appeared for the first time.

The following are specimens of current prices reported: Vermont—Orleans, 35 cents per bushel; Indiana—Perry, 75 cents; Illinois—Whiteside and Bureau, $1.25; Macon, $1.40; Hancock, $1.20; Iowa, Ringgold, 75 cents; Pottawattamie, 60 to 80 cents; Des Moines, $1 to $1.20; Kansas—Coffee, 80 cents; Nebraska—Adams, 65 to 95 cents; Otoe, $1 and rising; Idaho—Nes Perces, 50 to 75 cents.

MAINE.—*Waldo:* Light crop; shortened by drought and frost. *Oxford:* Crop light, but of good quality. *Piscataquis:* Will fall short a tenth; some plantings of extra yield and quality; one farmer raised 390 bushels per acre. *Androscoggin:* Crop light, but good. *Cumberland:* Yield large, quality excellent.

NEW HAMPSHIRE.—*Hillsborough:* Crop large and good. *Carroll:* Turned out splendidly; one farmer raised 375½ bushels per acre of fine tubers; one weighed 3½ pounds.

VERMONT.—*Lamoille:* Unusually good; larger percentage of starch than usual, with less rot. *Rutland:* Crop large and excellent. *Essex:* Never better. *Franklin:* Most excellent; marked contrast with last year. *Orleans:* Very ripe and good; selling at 35 cents per bushel at the starch factories.

MASSACHUSETTS.—*Berkshire:* Of good quality, but shortened by drought. *Franklin:* Good; average 50 cents per bushel. *Norfolk:* Abundant, and of better quality than for several years.

CONNECTICUT.—*Windham:* Never finer.

NEW YORK.—*Yates:* Yield fully up to last year; many tubers diseased. *Seneca:* Yield moderate, quality good. *Warren:* More sound than common. *Chemung:* Well matured on light dry soils, but not on heavy clay or strong loam. *Washington:* Peerless and late Rose rotting badly; price low. *Tioga:* Earlier varieties rotted on loam soils, on account of wet. *Saint Lawrence:* Excellent. *Erie:* Well harvested and closely sold up at 40 and 50 cents per bushel. *Columbia:* Fine in yield and quality. *Rockland:* Early plantings a half crop; late much better and of good quality. *Genesee:* Very fine. *Albany:* Suffered from drought. *Ontario:* Yield light; more or less rot. *Wyoming:* Did well. *Otsego:* Potatoes a fine large crop. *Alleghany:* Very short.

NEW JERSEY.—*Atlantic:* Unusually good; abundant rain since August. *Mercer:* Early potatoes shortened by drought; late plantings yielded heavily, but the quality was materially damaged by rot. *Burlington:* Late potatoes have done well; Early Rose, planted June 26, received the first premium at our county fair; White Peach Blows, planted July 2, were the best I ever saw. *Union:* Early Rose a very short crop; Peach Blows came out better than was expected. *Hudson:* Slightly injured by summer drought.

PENNSYLVANIA.—*Cambria:* Much affected by rot; one farmer lost 1,500 bushels. *Clinton:* Good, and in some cases extraordinary, especially the "Peerless." *Northumberland:* Better than last year and a fourth more in yield. *Wyoming:* On grass lawns rotting very badly. *Northampton:* Yielded better than last year, but three-fourths of the crop affected by dry rot. *Elk:* Considerably injured by bugs. *Beaver:* Crops light; tubers small. *Lawrence:* Half a crop, and poor quality from bugs. *Fayette:*

Injured by bugs. *Armstrong:* Tops bug-eaten or otherwise injured before the tubers ripened, especially late plantings. *Lehigh:* Rotting very much, especially Pink Eyes; Early Rose and Prince Albert least affected. *Jefferson:* Yield and quality good. *Lycoming:* Yield less than last year, but quality remarkably good. *Bucks:* Late potatoes rotting badly. *Lancaster:* Wet weather just before harvesting reduced the crop from near an average by causing rot.

DELAWARE.—*Kent:* Yield and quality good.

MARYLAND.—*Howard:* Late potatoes good; early ones very poor. *Dorchester:* Late pototoes excellent; early plantings shortened by drought. *Baltimore:* Late potatoes very fine; early ones shortened by drought. *Washington:* Large crop.

VIRGINIA.—*King and Queen:* Crops larger and better than last year. *Madison:* Abundant and good. *Spottsylvania:* Best crop for years. *Rockbridge:* Very fine. *Henrico:* Very fine, especially late plantings. *Orange:* Early Rose cut short by frost and drought. *Goochland:* Above average. *King George's:* Excellent. *Highland:* Injured by rot, worms, and bugs. *Clarke:* Exceeds last year's crop both in quantity and quality.

NORTH CAROLINA.—*Tyrrel:* Only early crops made. *Franklin:* Second crops good.

SOUTH CAROLINA.—*Fairfield:* Spring crop very good; late about average. *Orangeburgh:* Large and fine.

GEORGIA.—*Jackson:* Crop large, but poor in quality. *Muscogee:* Suffered from grass and then from drought. *Whitfield:* Too dry for potatoes.

ALABAMA.—*Lewiston:* Full average. *Crenshaw:* Average. *Calhoun:* Very fine.

TEXAS.—*Grimes:* Average. *San Saba:* Good. *Wood:* Very fine. *Burnet:* Destroyed by grasshoppers.

ARKANSAS.—*Bradley:* Increased average and improved quality. *Arkansas:* Crop good and well secured. *Cross:* Below average, but better than last year. *Garland:* Planted largely, but shortened by bugs and rot.

TENNESSEE.—*Dickson:* Late plantings shortened by drought; early plantings good. *Fentress:* Yield and quality good. *Hickman:* Half crop; rotted in the ground. *Haywood:* Too much rain in June. *Wilson:* Not so good as last year. *Wilkinson:* Decline in yield 60 per cent; increase in acreage 10 per cent. *Blount:* Short of last year 25 per cent. *Greene:* Crop good and sound. *Coffee:* Shortened by drought. *Putnam:* Crop large and fine.

WEST VIRGINIA.—*Raleigh:* Turned out finely. *Mercer:* Damaged by insects. *Pleasants:* Few planted for fear of bugs; yield good. *Marion:* Much better than usual where they escaped the bugs; fine, large, and good quality. *Brooke:* Good quality, but small; foliage devoured by Colorado beetles. *Jefferson:* Well matured, escaping frost. *Braxton:* Quality as good as last year, but the yield was reduced by bugs. *Monongalia:* Good, but some complaints of rot. *Harrison:* Excellent. *Tyler:* Product and quality good in spite of bugs.

KENTUCKY.—*Hardin:* Late plantings not a fifth of a crop. *Shelby:* Shortened by drought. *Laurel:* Very fine. *Lincoln:* Very fine. *McLean:* Injured by extreme wet weather. *Logan:* Very good. *Fayette:* Quality good, but yield below expectation; surplus selling at 60 cents per bushel. *Anderson:* Shortened by Colorado beetles. *Johnson:* Late planting good. *Owsley:* Never better. *Livingston:* Eaten by bugs. *Jackson:* Above average. *Jefferson:* Injured by bugs; northern seed make the best crop; native seed produced small tubers.

OHIO.—*Washington:* Injured by Colorado beetles. *Fulton:* Late planting and dry summer injured the crop greatly. *Franklin:* Greatly shortened by Colorado beetles. *Medina:* Reduced acreage; Colorado beetles destructive; half a crop. *Coshocton:* Good condition; reduced acreage. *Erie:* General yield light; I harvested 375 bushels from an acre with Carrier's potato-digger. *Wood:* Ten per cent. below last year's crop, which was but half average. *Lorain:* Used up by Colorado beetles in many cases. *Crawford:* Injured by bugs; unfavorable season. *Geauga:* Injured by bugs; where these kept away the crops were excellent in quantity and quality. *Henry:* Early Rose did well; Peach Blows suffered from drought. *Wyandot:* Too dry for potatoes. *Lawrence:* Full-grown and abundant. *Hamilton:* Very badly injured by Colorado beetles. *Perry:* Above average in quantity and quality. *Mercer:* Injured by bugs and drought.

MICHIGAN.—*Shiawassee:* Many fields not yet harvested, though covered with snow. *Mason:* Late plantings shortened by drought. *Lapeer:* Best crop for several years. *Calhoun:* Fair crops were secured by those who destroyed bugs. *Jackson:* Generally secured in good order. *Ottawa:* Injured by bugs and drought. *Oakland:* Good crop of good quality; early varieties best. *Oceana:* Suffered severely from drought and bugs. *Antrim:* Never better. *Berrien:* Short, but of good quality.

INDIANA.—*Owen:* Less than half average; excessive rains, then drought, then frosts. *Dubois:* Turned out well, especially early varieties. *Miami:* Short. *Montgomery:* Acreage reduced by late planting season; yield good. *Ripley:* Short, but fine quality. *Perry:* Small yield; price 75 cents per bushel. *Warren:* Half crop; drought. *Gibson:* Enough for home consumption; yield and quality fine. *Hamilton:* Scarce and fine.

Martin: Shortened by drought; bugs the whole season. *Steuben:* Colorado beetles not so destructive as formerly. *Wells:* Half crop, but excellent. *Brown:* Shortened by drought, but excellent; worth 60 to 70 cents per bushel. *Dearborn:* Early and medium plantings fair; late a failure. *La Porte:* Yield larger and better than last year in spite of bugs and drought. *Ohio:* Injured by drought and Colorado beetles.

ILLINOIS.—*Kankakee:* Almost a failure. *Fayette:* Good quality, but a little below average. *Pike:* Very short and poor. *Whitesides:* Very scarce; worth $1.25; half the home consumption must be imported. *Tazewell:* Shortened by drought and bugs. *Macon:* Almost a failure; only early plantings gave any return; shortened by drought and bugs; selling at $1.40 per bushel. *Putnam:* Almost destroyed by drought and bugs. *Bureau:* Almost a failure; sold at $1.25 per bushel. *Sangamon:* Greatly shortened by Colorado beetles. *Henry:* Shortened and depreciated in quality by drought. *Ogle:* Scarce, but good; selling at 75 cents to $1 per bushel. *Winnebago:* Late plantings did not mature. *Cass:* Lightest crop ever known here. *Edwards:* Yield large, but of poor quality. *Hancock:* Selling at $1.20 per bushel. *Knox:* Poorest crop ever raised here; Peach Blows hardly returned their seed; Peerless did better. *Mason:* A failure through drought and bugs. *Boone:* Shortened by drought and bugs; selling at 60 to 80 cents. *Clinton:* Injured by bugs and wet. *Lee:* Nearly a complete failure.

WISCONSIN.—*Clark:* Season too short. *Richland:* Many fields not dug and winter begun. *Calumet:* Early Rose least effected by the bugs. *Dodge:* Great variation in the field from 75 to 110 per cent. *St. Croix:* Reduced acreage; quality good; Colorado beetles troublesome. *Walworth:* Moderate crops of good quality. *Outagamie:* It looks as though root crops would remain undug all winter; snow 12 inches deep. *Green Lake:* Very fine. *Washington:* Early plantings average where the Colorado beetles were killed; Peach Blows greatly shortened by drought.

MINNESOTA.—*Kandiyohi:* Almost a failure through drought and bugs in some portions of the county. *Steele:* Average and of the finest quality; acreage increased. Colorado beetles not very injurious. *Redwood:* Almost a failure through drought and grasshoppers. *Martin:* Injured by grasshoppers.

IOWA.—*Shelby:* Poorest crop yet known. *Ringgold:* Injured by extreme drought in summer and very scarce; sell at 75 cents per bushel. *Story:* Damaged by the backward spring and early frosts. *Clarke:* Badly injured by summer drought. *Decatur:* Nearly a failure. *Harrison:* Acreage reduced on account of low prices; crop almost a failure through drought and grasshoppers. *Mills:* Half a crop. *Montgomery:* Injured by drought. *Boone:* Almost a failure through drought. *Fayette:* Injured by drought and Colorado beetles; early plantings best. *Hardin:* Early plantings best; Peach Blows light. *Audubon:* Shortened by late spring, summer drought, and bugs; tubers small and poor. *Benton:* Late plantings destroyed by early frosts. *Plymouth:* Injured by grasshoppers. *Linn:* Crop very short; quality excellent. *Des Moines:* Selling at $1 to $1.20 per bushel. *Pottawattamie:* Shortened by Colorado beetles; selling at 60 to 80 cents per bushel. *Winnesheik:* Early plantings good; late a light crop on account of bugs and drought in the latter part of the season. *Louisa:* Early plantings good; late plantings injured by drought. *Marion:* From one-eighth to half a crop. *Monona:* Crops large and fine. *Guthrie:* Half a crop but very good in quality. *Calhoun:* Very few in the hill.

MISSOURI.—*Caldwell:* Early planting good; Scotch russets good; Peach Blows poor. *Audrain:* An entire failure. *Platte:* Early plantings did well; late plantings scarce return their seed. *Clinton:* One-fifth of last year's crop; tubers small and inferior. *Harrison:* Short but good. *Baxter:* Reduced by drought to a half crop. *Douglas:* Early potatoes good; late a failure. *Pettis:* Suffered greatly from Colorado beetles. Some success in the use of powder, glass, and coarse flour, dusted on the vines through a fine cloth, while the dew was on. Care should be taken not to inhale the glass-dust. *Adair:* Half crop, but good quality. *Howard:* No potatoes worth mentioning, except the Early Rose: *Perry:* Late planting a failure through drought. *Phelps:* Early plantings good; late nearly a failure. *Franklin:* Average yield and quality. *Maries:* Injured by bugs and drought, but partially recovered before harvest. *Laclede:* About 50 per cent. short. *Stone:* Half crop and poor. *Dallas:* Only early varieties planted; hence the drought was too late for serious injury. *Newton:* A little better than last year in quantity, but quality not so good. *Cole:* Late plantings failed, except in a few bottoms.

KANSAS.—*Miami:* Greatly shortened by summer drought. *Clay:* Much injured by drought; early frosts. *Bourbon:* Shortened by drought. *Shawnee:* Late plantings almost worthless. *Washington:* Almost a failure. *Jefferson:* Early plantings good; late almost a total failure. *Labette:* Early plantings good; late poor; *Linn:* Early plantings of early varieties did well, but late was injured by drought. *Montgomery:* Shortened one-half by drought. *Woodson:* Total failure on many farms; bottoms that last year returned 300 bushels per acre yielded only 50. *Coffey:* Early plantings fair; late a fourth of a crop; selling at 80 cents per bushel. *Republic:* Early Rose average; late plantings short. *Cowley:* Early plantings good; late ones tolerable. *Osage:* Nearly all plantings after May 1 are worthless. *Smith:* In the south part of the

county early crops were injured by bugs and worms, and late ones by grasshoppers. In the north part Early Rose, Buckeyes, and Peach Blows did best. *Riley:* Almost a failure. *Neosho:* Early plantings good; late a complete failure, except in low lands.

NEBRASKA.—*Johnson:* Nearly a failure. *Thayer:* Almost a failure; hogs very injurious. *Pawnee;* Shortened by drought four-fifths; dryest season for fifteen years. *Adams:* Ten per cent. better than in the river counties; 65 to 95 cents per bushel. *Antelope:* Early varieties did well; late ones nearly a failure. *Nemaha:* Late plantings ruined by drought; early good but limited in acreage; late varieties frosted. *Cass:* Almost a failure. *Otoe:* Almost a failure: $1 per bushel and rising.

CALIFORNIA.—*Alameda:* Full average and good. *San Luis Obispo:* Greatly injured by grasshoppers.

OREGON.—*Tillamook:* Greatly injured by blight

COLORADO.—*El Paso:* Potatoes have produced enormously in some localites, while in others they will not grow at all. *Larimer:* Almost a failure.

UTAH.—*Kane:* Late rains have made the best crop for years. *Morgan:* Crops good, but acreage decreased. *Weber:* Excellent.

DAKOTA.—*Clay:* Injured by hogs and drought.

IDAHO.—*Ada:* Injured by frosts. *Nez Perces:* Crop all that could be asked; yield abundant and excellent, selling at 50 to 75 cents per bushel.

ARIZONA.—*Yavapai:* Increased by late rains.

MONTANA.—*Deer Lodge:* One-third of the crop frozen in the ground in September; fortunately there is a large surplus.

NEW MEXICO.—*Mora:* Drought restricted planting.

WASHINGTON.—*Thurston:* Rotted in low ground. *Clallam:* Rot for the first time.

SWEET POTATOES.

This crop was a fair one both in yield and quality. The States having the highest per cent. of product compared with last year are Texas, 125; South Carolina, 116; Georgia, 114; Alabama, 112; Florida, 110; West Virginia, 107; the lowest, New Jersey, 60; Iowa, 77; Missouri, 81. The other States in which they are grown range between these figures.

NORTH CAROLINA.—*Chowan:* Half crop. *Craven:* Damaged by rain. *Tyrrel:* Below average. *Greene:* Poorest crop ever housed. *Haywood:* Best crop ever known.

SOUTH CAROLINA.—*Georgetown:* Yield increased 10 per cent. *Fairfield:* Average.

GEORGIA.—*Jackson:* Full average. *Spalding:* Fine. *Liberty:* Injured by rain.

ALABAMA.—*Lewiston:* Full average. *Crenshaw:* Twenty-five per cent. above average. *Clinch:* Very good. *Wilcox:* Doing well. *Calhoun:* Injured by fall drought. *Clarke:* Better than last year.

MISSISSIPPI.—*Lee:* Heavy yield, fine quality; 150 to 200 bushels per acre; selling at $1 per bushel. *Hancock:* Did well.

LOUISIANA.—*Rapides:* Inferior in yield and quality.

TEXAS.— *Rusk:* Tubers large but few to the row; too much vine. *Ellis:* Tubers abundant; of good size and quality. *De Witt:* Promising. *Milan:* Better than usual. *Upshur:* Fine quality and heavier crop than usual. *Kendall:* Very good. *Austin:* Large crop, but of quality inferior to last year's.

ARKANSAS.—*Fulton:* Improved by late rains. *Prairie:* Short. *Garland:* Fine yield.

TENNESSEE.—*Dickson:* Good quality, but shortened by drought. *Fentress:* Large yield, but not keeping well. *Hickman:* Fine. *Wilson:* Very fine; 20 per cent. above last year. *Blount:* Generally very good. *DeKalb:* Heavy crop, though injured by frost. *Coffee:* Shortened by drought. *Putnam:* Crop large and fine.

WEST VIRGINIA.—*Braxton:* About the same as last year. *Doddridge:* Injured by drought.

KENTUCKY.—*Laurel:* Very fine. *Logan:* Superb. *Fayette:* Fair. *Owsley:* Never better. *Livingston:* Tolerable; quality good. *Jackson:* Better than in any former year.

OHIO.—*Washington:* Increased acreage. *Lawrence:* Large and fine.

MICHIGAN.—*Berrien:* Short, but of good quality.

INDIANA.—*Ripley:* Plenty and good. *La Porte:* Less in quantity than last year, but better in quality.

ILLINOIS.—*Bureau:* Crop small, but good. *Cass:* Good. *Mason:* Good quality.

IOWA.—*Harrison:* Good yield and quality.

MISSOURI.—*Baxter:* Fair.

KANSAS.—*Labette:* Decreased acreage; yield and quality good.

HAY.

Maine and New Hampshire report the hay crop larger than in 1872; in the other New England States, and in New York, the quantity is less, but the deficit is probably fully made up by the superior quality. Rutland and Franklin Counties, Vermont, and Berkshire, Massachusetts, estimate that the yield, though smaller, will carry more stock through the winter. In Delaware and Missouri the product equals that of last year; in Kentucky, Ohio, Michigan, Illinois, Wisconsin, Kansas, and Nebraska, it falls below; in the remaining States it is above. Those in which the per cent. of gain, compared with 1872, is greatest, are: Texas, 160; Oregon, 133; South Carolina, 130; Virginia, 125; Alabama, 123; Maryland, 116; Tennessee and California, 115; West Virginia, 114; New Hampshire, 110; Maine, 108. Those in which the per cent. of loss is greatest: Rhode Island, 82; Vermont and Massachusetts, 88; Wisconsin, 90; Illinois, 91; New York and Kansas, 93.

With rare local exceptions the returns throughout represent the quality and the condition in which it was cured as better than in 1872. In New Jersey, Gloucester, the first crop was shortened by drought, but the second was heavy. In Pennsylvania, Wyoming, the crop was never better; Armstrong, the deficiency of the first crop was made up by the second. In Virginia, King and Queen and Madison, report the crop both larger and more nutritious than last year; Dinwiddie, increased attention to the production of hay; and similar reports come from Craven, North Carolina, and Orange, South Carolina. In Florida, Richmond, the yield of cow-pea hay and Hungarian grass was 100 per cent. greater than last year. In Texas the hay-crop was abundant in every county reporting. Hamilton reports that the indigenous mesquite-grass excels the blue-grass from the North; Grimes, that the quantity of hay saved is increased year by year; Titus, that experimental hay-crops have yielded astonishing results; Coryell, more hay saved than ever before; Parker, sixty tons of Hungarian-grass raised by one farmer on twenty acres; Collin, considerable shipments of prairie-hay. In Arkansas, Fulton, Italian rye-grass from the Department succeeded finely. In Tennessee, Wilson, Hungarian-grass and millet of different kinds, especially German, were very productive; Wilkinson reports an increase of 50 per cent. in acreage, and of 30 in yield. The only specially adverse report from this State is from Coffee, "the third short hay-crop; no winter-grass for stock." In Ohio, Washington reports meadows, and Mercer timothy, nearly run out, owing to three successive droughts; Lorain, the crop ruined by grasshoppers, and Wyandot, by drought. The crop was cut short in Shiawassee, Michigan, by the backward spring; in Livingston, by winter-killing; and in Oakland, by the drought. In Perry and Edwards, Illinois, hay was shortened by the army-worm. Saint Croix, Wisconsin, reports that the acreage in hay increases annually, and Baxter, Missouri, an increase in the cultivation of tame grasses. Reports, respecting both quantity and quality, are generally favorable from Minnesota, Iowa, and Missouri. Clay, in Kansas, and Sage, in Nebraska, report large quantities of hay and wheat stacked in the field burned by prairie fires. In Tillamook, Oregon, the acreage is 100 per cent. greater and the yield greater than in 1872.

The quantity of hay produced this year in the United States is about 500,000 tons less than last, when it was not far from 24,000,000 tons. Much the largest part of the decrease indicated is in New York, being over 316,000 tons. But as the average quality is much better than last year, and as pasturage throughout the country, with a few limited excep-

tions, has been good during the autumn, stock, wherever reasonably cared for, may be expected to enter winter-quarters in good condition, and to maintain it until they come out.

MAINE.—*Waldo:* Extra in quantity and quality. *Piscataquis:* Average quantity, quality extra; fine harvest weather. *Androscoggin:* Crop good. *Sagadahoc:* Very good. *Cumberland:* Full average quantity and fine quality.

NEW HAMPSHIRE.—*Hillsborough:* Very fine; fall feed abundant; cattle will go to the barn with a better stock of hay than last year.

VERMONT.—*Rutland:* A little less in bulk than last year, but its fine quality makes it more valuable. *Franklin:* Less in quantity than last year, but will carry more stock through the winter.

MASSACHUSETTS.—*Berkshire:* Less in quantity, but of greater value than last year, on account of better quality; fine growing and harvest weather. *Plymouth:* First crop of hay small, but on good soils the second crop was large. *Norfolk:* Crop large and good; fall feed good.

CONNECTICUT.—*Windham:* Excellent; scarcely a drop of rain in harvest. *Hartford:* Average and of good quality; fall feed abundant.

NEW YORK.—*Yates:* More hay cut than last year; clover considerably injured by harvest rains. *Seneca:* Crop moderate but of good quality. *Chemung:* Ten per cent. better than last year's light crop. *Washington:* Larger second crop of hay than usual. *St. Lawrence:* Crop good and well secured; fall feed abundant. *Columbia:* From $15 to $20 per ton. *Rockland:* Short; selling at $35 per ton. *Madison:* Fall feed good. *Genesee:* Second crop of clover good. *Albany:* Crop light. *Ontario:* Crop shortened by June drought. *Alleghany:* Short in the north half of the county; in the south half average.

NEW JERSEY.—*Atlantic:* Salt-hay and black-grass our main dependence. *Hunterdon:* Pasture better than ever known at this season. *Sussex:* Fully as much hay as usual has been secured, but the upland hay is not as good as usual; bottom crops more or less injured by rain after cutting. *Cumberland:* Hay but half average; timothy of good quality, but clover rather poor, being coarse and stemmy. *Gloucester:* First crop shortened by drought; second crop heavy. *Burlington:* Fall pasture good. *Warren:* Timothy good and well secured; clover short and badly secured. *Hudson:* Greatly injured by drought and ox-eye daisy; pastures benefited by late rains.

PENNSYLVANIA.—*Wyoming:* Crop never better. *Beaver:* Pastures better than for several years, and live-stock in better condition. *Lawrence:* Meadows injured by severe frosts. *Fayette:* Half crop, but good quality. *Armstrong:* Second crop of hay good, making up the deficiency of the first crop. *Jefferson:* Below average, but better than last year; fodder must be economically used. *Northumberland:* Large and and fine yield. *Crawford:* Damaged by late spring frosts and afterward by drought.

MARYLAND.—*Howard:* Greatly improved by seasonable weather this year. *Carroll:* Pastures good. *Baltimore:* Crop shortened by drought, but better than last year.

VIRGINIA.—*King and Queen:* Crop larger and more nutritious than last year. *Pulaski:* Fall pastures good. *Fauquier:* Hay-crop good; pasturage holds out well. *Fairfax:* Crop below average from drought. *Rockbridge:* Late pastures good. *Henrico:* Crab-grass hay enough made to winter our cattle on. *Madison:* Largely in excess of last year; quality good. *Spottsylvania:* Hay and fodder crops large. *Pittsylvania:* Grass-crops never recovered from the July drought. *Lunenburg:* Little or no hay raised; cattle fed almost entirely on corn-fodder. *Goochland:* Hay-crop much greater than last year and fine. *Highland:* Yielded well; quality good. *Greenville:* Good hay season, but the cotton mania has restricted its cultivation; in some cases the grass is allowed to die without cutting. *Bath:* Hay extra. *Dinwiddie:* Season favorable to hay; increased attention to grass-crops.

NORTH CAROLINA.—*Craven:* Attracting more attention and an increased quantity secured; native grasses constitute the staple, but clover is becoming a favorite in some places. *Tyrrell:* Average in quantity, but inferior. *Forsyth:* Very fine, bringing 40 cents per hundred. *Robeson:* Only crab-grass cured.

SOUTH CAROLINA.—*Williamsburgh:* Short; lack of sunshine. *Marlborough:* Unusually fine. *Fairfield:* Hay abundant where saved. *Orangeburg:* More attention to hay; land too poor for blue-grass.

GEORGIA.—*Floyd:* Shortened by wet, especially clover. *Muscogee:* Crop considerably increased. *Oglethorpe:* Above average. *Whitfield:* Light, but of fine quality. *Richmond:* Yield of cow-pea hay and Hungarian grass double last year's; spontaneous summer grasses from 75 to 100 per cent. in advance of last year; few cultivated varieties.

ALABAMA.—*Montgomery:* Especially fine. *Calhoun:* Short but good.

LOUISIANA.—*East Baton Rouge:* Abundant and fine. *Iberia:* Hay $5 to $8 per ton.

TEXAS.—*Hamilton:* Our indigenous mesquite-grass excels the blue-grass from the North. *Grimes:* More hay saved every year. *De Witt:* Native grasses abundant and

fine. *Harris:* Native grasses choice and abundant. *Coryell:* More hay saved than ever before; wild pasture unusually fine, the live-stock being greatly reduced by being driven to Kansas. *Collin:* Considerable shipments of prairie-hay. *Bee:* Prairie-grass as good as for fifteen years past. *Milam:* Finest grass-crop for ten years. *Titus:* Experimental hay-crops have yielded astonishing results. *Parker:* Crop good; one farmer raised 60 tons of Hungarian grass on 20 acres. *Kendall:* Prairie-hay never better. *Kaufman:* Kentucky blue-grass fine; Lucerne bids fair; Italian rye-grass died out. *Austin:* Large quantity of hay made.

ARKANSAS.—*Fulton:* Italian rye-grass has done finely; prairie-grass as good as ever known.

TENNESSEE.—*Dickson:* Grew well, but yielded short. *Hickman:* Better than last year in quantity and quality. *Obion:* Hay a fine crop. *Wilson:* Annual grasses, such as Hungarian and different kinds of millet, yielded finely; German millet has done especially well. *Grundy:* Turned out remarkably well. *Giles:* Unusual yield of hay, and secured in No. 1 condition. *Wilkinson:* Increase of 50 per cent. in acreage and 30 per cent. in yield. *Blount:* A little short. *Sumner:* Immense hay-crop; large acreage in Hungarian grass and German millet; timothy never more abundant. *Greene:* Better than usual. *Lincoln:* Italian rye-grass from the Department growing finely; can scarcely be distinguished from grass growing on my farm for forty years. *Coffee:* The third short hay-crop; no winter-grass for stock. *Putnam:* Of excellent quality, and secured in prime condition. *Fayette:* Unusual amount of hay saved, especially wild grasses. *Robertson:* Timothy and herd-grass better than last year; clover not so good.

WEST VIRGINIA.—*Mercer:* A good hay-crop, and secured in good order. *Pleasants:* Damaged by rain in harvest. *Marion:* Fall pastures better than for three years. *Braxton:* Crop larger and better than last year. *Harrison:* Crop heavy, and secured in tolerable order; fall pastures not very good.

KENTUCKY.—*Oldham:* Below average, but secured in good order. *Logan:* Fine, and secured in good condition. *Fayette:* A little short, but of excellent quality. *Johnson:* Generally good. *Owsley:* Hay and grass crops very fine.

OHIO.—*Washington:* Meadows mostly run out; drought for three years has prevented their resetting. *Fulton:* Hay below average, but better than last year. *Medina:* Scarce. *Coshocton:* Above average, and secured in good condition. *Lorain:* Injured by grasshoppers; pastures very short. *Wyandot:* Shortened by drought. *Lawrence:* Light and scarce; brings $22 per ton. *Perry:* Much above last year, and would have been greater but for floods last spring, especially on bottom-lands. *Mercer:* Timothy nearly ruined by three successive droughts.

MICHIGAN.—*Shiawassee:* Cut short by the backward spring; crop secured in good condition. *Mason:* Crop fine. *Lapeer:* Fair crop of good quality, and well secured. *Ottawa:* Good hay-crop. *Oakland:* Shortened by drought. *Antrim:* A good yield and quality. *Livingston:* Light; badly winter-killed; fall pasturage good and abundant.

INDIANA.—*Owen:* Injured by excessive rains. *Morgan:* Excellent. *Wells:* Injured by rains. *Brown:* Crop heavy, but injured by rain; worth $10 per ton. *Dearborn:* Average, but injured by white-top and other weeds. *La Porte:* Shortened by early drought; quality brought to average by late rains. *Floyd:* Light. *Ohio:* Shortened by winter-killing and weeds, especially white-top daisy.

ILLINOIS.—*Pike:* Two-thirds of a timothy crop, but clover enough to make up the deficit; very late fall pasture fair. *Whiteside:* Light, but of excellent quality. *Perry:* Shortened by army-worms. *Henry:* Short, but excellent. *Edwards:* A large crop, but depreciated in value by army-worms; weedy. *Mason:* A good yield and quality; seldom better. *Piatt:* Pastures good. *Clinton:* Light, but well secured. *Lee:* Pastures poor.

WISCONSIN.—*Adams:* Timothy a half crop, but the excellence of the marsh-meadows made up for the deficiency. *Dodge:* Acreage reduced; quality depreciated by harvest rains. *Fond du Lac:* Clover-hay shortened by winter-killing. *St. Croix:* Acreage in hay annually increasing. *Walworth:* Light but of good quality. *Washington:* Early-cut clover was damaged by rainy weather; late-cut clover and timothy made excellent hay.

MINNESOTA.—*Steele:* Extra in quantity and quality. *Martin:* Heavy; good mowing prairie-hay on high lands.

IOWA.—*Decatur:* Saved in the best order. *Harrison:* Unusually good; mostly prairie. *Boone:* Excellent in yield and quality. *Appanoose:* Crop immense; from 200 to 500 acres of meadow on single farms; yield enormous and quality good. *Fayette:* Of splendid quality. *Hardin:* Grass-crop shortened by early frosts and prairie fires. *Plymouth:* Abundant and excellent. *Marion:* Saved in good order.

MISSOURI.—*Caldwell:* Very good and secured in fine order. *Maniteau:* Fall pastures good. *Clinton:* Rains in May made the crop very good; good harvest weather. *Harrison:* Well saved. *Clay:* A good yield; saved in good order. *Baxter:* Good;

large quantity secured in good order; tame-grass culture increasing. *Phelps:* Very good. *Franklin:* Good. *Newton:* Shortened by drought; quality good. *Cole:* Splendid crop and secured in the finest order.

KANSAS.—*Nemaha:* Very large quantities put up and of superior quality. *Clay:* Large quantities of hay as well as wheat in the field burned by prairie-fires. *Jefferson:* Crop short but well secured and in good order. *Cowles:* Good, and got up in good condition.

NEBRASKA.—*Antelope:* Crop large and excellent; all of natural grasses. *Sage:* Much hay and stacked grain destroyed by prairie-fires.

CALIFORNIA.—*San Luis Obispo:* Pastures poor; without speedy rain live stock must suffer.

OREGON.—*Tillamook:* Acreage of hay double last year's; yield increased. *Douglas:* More or less injured by June and July rains; grass will be short the coming winter.

UTAH.—*Kane:* Hay, mostly alfalfa, a large crop, but late cuttings are inferior.

ARIZONA.—*Yavapai:* Increase of hay yield from late rains and more acres cut; all wild grass except 150 tons of Hungarian, alfalfa, &c. *Santa Ana:* A complete failure. *Thurston:* Abundant, but not well secured.

SUGAR-CANE.

In all the Gulf States there are counties reporting the cultivation of sugar-cane to some extent. But outside of Louisiana it is evident that this production is small. In Georgia all the counties reporting show a crop in advance of last year's, which is probably the result of increased acreage, as injuries to the cane-crop are reported in some localities from drought and in others from excessive rains. In Florida, which returned 50 per cent. more sugar in the late census than Georgia, there was more variation in the yield, several counties reporting a decrease. Much injury was done to the crop by the severe gales of September. All the counties reporting sugar-cane in Alabama indicate an increased yield, but as the total crop of this State, reported in the census, amounted to only 31 hogsheads, this increase will but lightly affect the general aggregate. The same remarks apply to Mississippi to a still greater degree. In Louisiana, several of the larger sugar-producing parishes indicate a yield equal to last year's, while several smaller ones report an increase, but these indications are more than counterbalanced by adverse reports from several large parishes. Lafourche and Assumption, which, together, produced 18.62 per cent. of last year's crop of the State, (108,520 hogsheads, according to Bouchereau,) this year show a decline, the former of 15 and the latter of 20 per cent. Several counties in Texas, whose sugar-crop was too small to find a place in the census, indicate a greatly increased yield, but counties producing much larger crops report a serious decline. Brazoria, for instance, which returned 1,423 hogsheads of the 2,020 reported from the whole State in the census, estimates this year's crop at only 65 per cent. of last year's. In this county the stubble-crop is poor, while the acreage both in stubble and plant cane has been reduced. In some localities in Texas irrigation was used with good results in the culture of sugar-cane.

GEORGIA.—*Marion:* Sugar-cane good, but would have been better with a seasonable fall; no rain for ten weeks. *Liberty:* Injured by rain.

FLORIDA.—*Manatee:* Much injured by storm of October 6. *Jefferson:* Damaged 10 per cent. by late storms. *Leon:* Good, but suffered greatly by the gale of September 19. *Wakulla:* Materially damaged by the September gale. *Jackson:* Acreage increased; good as last year. *Crenshaw:* Grows well.

LOUISIANA.—*Assumption:* Greatly improved since last report. *East Baton Rouge:* Promising. *Lafourche:* Reports not encouraging. *Rapides:* Better than last year. *Saint Mary:* Stubble-cane a failure, yet the general average equals last year's.

TEXAS.—*San Saba:* Does well with irrigation. *Brazoria:* Stubble poor; acreage of both stubble and plant cane less than last year. *Titus:* Does well.

BUCKWHEAT.

Rhode Island, Maryland, and all the cotton States, except North Carolina and Tennessee, return no buckwheat. The yield compared with last year was, in Vermont, 116; Virginia, 111; Tennessee, 110; Massachusetts, 108; New York, 106; Oregon, 105; New Jersey, 104; California, 102; Connecticut and North Carolina, 100; in the other States less than 100, the lowest being Nebraska, 40; Iowa, 53; Kansas, 56; Illinois, 57, Missouri, 61.

Trials of Silver-hull buckwheat distributed by the Department were for the most part quite successful. In York, Pennsylvania, 4 quarts yielded 5 bushels of good quality; in Virginia, Page, 2 quarts yielded 2 bushels; in Floyd, the seed yielded forty-fold; in Highland, it is reported as "our best variety; ripens earlier, and hence may be sown earlier, escaping early frosts and late hot sunshine." In Mercer, West Virginia, it also ripened earlier, and was better filled than the common variety. Further results of experiments with it will be found noted in the extracts which follow:

NEW YORK.—*Washington:* Less sown than usual; crop good. *Tioga:* A little extra. *Albany:* A fair crop. *Wyoming:* Large yield.

NEW JERSEY.—*Warren:* Good average crop; good thrashing weather.

PENNSYLVANIA.—*York:* Quality good. *Armstrong:* Extra good crop. *Lawrence:* Injured by early frosts. *Elk:* Increased acreage. *Northumberland:* Crop large and fine; no early frosts.

VIRGINIA.—*Warren:* Buckwheat very fine. *Spottsylvania:* Crop large. *Northumberland:* Promises to thrash out well. Silver-hull does not suit our climate. *Page:* Crop good. *Washington:* Amounts to nothing; 2 quarts of Silver-hull from the Department produced 2 bushels; ripened two weeks earlier than the common variety, and doubled its yield. *Highland:* Growth good, but much destroyed by squirrels, turkeys, &c., there being no mast in the woods. *Floyd:* Silver-hull a success; seed produces 40 fold. *Greenville:* Seed from the Department did not do well; needs acclimation.

NORTH CAROLINA.—*Stanley:* Taken by rats and rabbits.

SOUTH CAROLINA.—*Orangeburg:* Silver-skin a failure.

GEORGIA.—*Taylor:* Silver-hull from the Department very favorably reported.

TEXAS.—*Denton:* Buckwheat from the Department very fine considering the drought.

ARKANSAS.—*Arkansas:* Grew luxuriantly, but has no seed in the chaff. *Garland:* Gained 5 per cent. in quantity and 40 per cent. in quality.

WEST VIRGINIA.—*Grant:* Badly injured by frost. *Mercer:* Slightly over average; Silver-hull did well; matures a week earlier and is better filled than the Black-hull. *Fayette:* Three quarts Silver-hull produced 1½ bushels; the straw is objectionable. *Tyler:* Generally good.

OHIO.—*Vinton:* Crop would have been large but for early frosts. *Medina:* Reduced to half a crop by grasshoppers and early frosts. *Coshocton:* Above average; increased acreage. *Wood:* Almost a total failure.

MICHIGAN.—*Shiawassee:* Early sowings escaped damage, but the frost cut down the yield below average. *Berrien:* Shortened by drought.

INDIANA.—*Ripley:* Greatly damaged by frost.

ILLINOIS.—*Bureau:* Almost a failure. *Winnebago:* Not half a crop.

WISCONSIN.—*Green:* Almost a failure. *Adams:* Scalded in the blossom and did not fill; some fields not harvested. *Dodge:* Drought prevented the grain from filling; only 75 per cent. of an average. Silver-hull about the same as our native varieties. *Green Lake:* Injured by drought and early frost.

MINNESOTA.—*Isanti:* Silver-hull a great acquisition; cropped well and ripened early.

IOWA.—*Clarke:* Badly injured by summer drought. *Mills:* All frost-killed. *Hardin:* Frosted. *Tama:* Failure through drought and early frost. *Benton:* Mostly destroyed by frost. *Des Moines:* A total failure because of drought; silver-hull two weeks earlier than either the black or gray. *Jefferson:* Ruined by frost. *Wayne:* Almost a total failure through frost. *Louisa:* Ruined by drought; won't pay for harvesting. *Monona:* Increased acreage, but swept by grasshoppers. *Calhoun:* Killed by early frost. *Grundy:* Almost ruined by September frosts.

MISSOURI.—*Caldwell:* Entirely ruined by drought. *Clinton:* Destroyed by early frost. *Harrison:* Almost a failure through frost. *De Kalb:* Nearly a failure. *Howard:* Nearly destroyed by frost. *Mercer:* Silver-hull yielded 3 bushels very fine from 4 quarts

of seed. *Cass:* Almost a failure. *Laclede:* A fourth of a crop. *Pemiscot:* Silver-hull yielded well.

KANSAS.—*Nemaha:* Area largely increased, but very little has been harvested, and that of inferior quality; silver-hull did best. *Howard:* Silver-hull from the Department failed through drought. *Shawnee:* Mostly killed by early frost. *Washington:* Killed by early frost. *Jefferson:* Nearly a failure through drought. *Labette:* Almost a failure from drought. *Woodson:* A total failure; even the silver-hull, which last year yielded 50 per cent. more than the common seed, failed through drought. *Coffey:* Hardly half a crop. *Cowley:* Silver-hull not successful here. *Osage:* Ruined by drought and insects. *Smith:* A failure. *Cherokee:* Silver-hull destroyed by prairie-chickens.

OREGON.—*Grant:* Materially injured by early frosts.

DAKOTA.—*Clay:* A failure.

IDAHO.—*Bon Homme:* Killed by early frosts. *Nez Perce:* Silver-hull from Department did well though late sown.

BEANS AND PEASE.

MAINE.—*Piscataquis:* Beans largely killed by frost August 28. *Androscoggin:* Beans good.

VERMONT.—*Franklin:* Decreased acreage, but the stock of merchantable beans is larger than last year. *Lamoille:* Beans raised on a larger scale than formerly by a few farmers.

NEW YORK.—*Tioga:* Beans and pease good. *Wyoming:* Beans a large yield.

VIRGINIA.—*Clarke:* Abundant and good.

NORTH CAROLINA.—*Chowan:* Pease a half crop. *Gaston:* Pea-crop unusually fair. *Greene:* Early frost cut the pea-crop short 25 per cent. *Haywood:* Beans very prolific. *Martin:* Pease a good crop.

SOUTH CAROLINA.—*Williamsburgh:* Pease a fine crop, but harvesting is costly, encroaching on the margin of profits. *Marlborough:* Pease nearly a failure.

GEORGIA.—*Jackson:* Beans and pease very good. *Whitfield:* Pea-crop large and sound.

TEXAS.—*Upshur:* Fine pea-crop, helping out the deficient corn-crop. *Cherokee:* Pea-crop fine.

ARKANSAS.—*Bradley:* Increased acreage. *Garland:* Pease cut short by drought, but equal to last year; beans yielded a surplus and sold well.

TENNESSEE.—*Blount:* Pease good.

WEST VIRGINIA.—*Mercer:* Beans and pease good.

OHIO.—*Washington:* Beans largely planted to meet the anticipated deficiency in potatoes. *Medina:* Beans extensively planted to make up an anticipated deficiency in potatoes, but grasshoppers and early frosts diminished the yield to an average.

MICHIGAN.—*Livingston:* Beans a good yield of good quality.

ILLINOIS.—*Knox:* Beans frosted.

WISCONSIN.—*Dodge:* Beans a good crop and well cured.

MINNESOTA.—*Steele:* Small crops, but fair.

IOWA.—*Monona:* Beans and pease planted in larger quantities than ever before, but destroyed by grasshoppers.

MISSOURI.—*Laclede:* Beans half crop.

NEBRASKA.—*Antelope:* Beans rusted badly; much eaten by grasshoppers.

OREGON.—*Grant:* Beans materially injured by frost.

UTAH.—*San Pete:* Beans light, but good; pease not so abundant as last year, but of excellent quality.

IDAHO.—*Ada:* Beans injured by frosts.

DAKOTA.—*Bonhomme:* Beans injured by grasshoppers.

NEW MEXICO.—*Mora:* Better than last year, but below average. *Doña Aña:* Beans and pease injured by lack of water.

TOBACCO.

The average in comparison with last year is 94. The returns for tobacco make the yield above that of 1872 in West Virginia, 129; Kansas, 114; Arkansas, 108; Virginia, 102; Illinois, 101; New Hampshire, New York, Texas, and Oregon, 100. The other States range between 70 in Pennsylvania and 98 in South Carolina and Florida. In condition, Connecticut reports an average of 133; Massachusetts, 120; New Hampshire, 118; Vermont, 110; Maryland, Louisiana, and Oregon, 106; Kansas, 102; Virginia, Georgia, and Alabama, 101 Other States range between 100 in Illinois and 91 in Missouri.

MASSACHUSETTS.—*Franklin:* Tobacco is doing well; no pole-sweat; scarcity of money prevent the early marketing of the crop.

CONNECTICUT.—*New Haven:* Excellent where not frosted.
PENNSYLVANIA.—*Lancaster:* Crop short.
MARYLAND.—*Howard:* Good season and good crop.
VIRGINIA.—*Madison:* Generally cut before frost, and curing handsomely. *Fluvanna:* Full crop, though much of it was late. *Pittsylvania:* Did not recover from July drought. *Rockbridge:* Failed; did not get a good stand. *Chesterfield:* Heavy yield, but badly frosted. *Buckingham:* Large crop well secured; fine harvest-season. *Mecklenburg:* Short crop planted and it failed to mature; much was cut green. *Spottsylvania:* Crop large; season fine; no frost until October 13. *Orange:* Crop had a bad start, but subsequent good weather made a fair yield. *Goochland:* More tobacco made than in any year since the war; quality good. *Cumberland:* Very fine. *Nelson:* Much had to be cut green to escape frost; curing season good. *Dinwiddie:* Scarcity of plants and increased cotton culture reduced the acreage; crop injured by rains.
NORTH CAROLINA.—*Person:* Yield heavy and good. *Alamance:* Poor stand at starting; grew rapidly later in the season, but produced but little fine tobacco; cut before ripening. *Forsyth:* Good and secured. *Rockingham:* Heavy, but inferior on account of late rains. *Caswell:* Planting delayed by drought; later rains caused a second growth, which did not mature well; fine tobacco scarce.
FLORIDA.—*Gadsden:* Large increase of Cuba tobacco.
ALABAMA.—*Crenshaw:* Acreage 25 per cent. increase; yield 25 per cent. above average. *Hancock:* Increased acreage and good quality; seed mostly brought from Havana.
TENNESSEE.—*Dickson:* Good crop well secured; injured somewhat by worms. *Obion:* Very good. *Williamson:* Acreage 25 per cent. less; quality 25 per cent. better. *Sumner:* Injured by frost in some places; increased acreage will make up the deficiency; *Smith:* Ten per cent. over last year's yield. *Trousdale:* Not so good leaf as last year. *Putnam:* Crop large, excellent, and well secured. *Robertson:* About 600 pounds per acre average; quality 25 per cent. below last year.
WEST VIRGINIA.—*Grant:* Badly frosted. *Mercer:* Very good; increase acreage; more attention to this crop.
KENTUCKY.—*Hardin:* Above average in quantity, but inferior in quality. *Oldham:* Secured in good order; shortened by drought. *Adair:* Larger acreage than ever before; late planted and somewhat frosted. *Laurel:* Above average in spite of frost. *Nicholas:* Drought injured late plantings; worms bad. *Pendleton:* Stand late and consequently ripened late, reducing the quality, though but little was frosted. *Taylor:* Crop greatly reduced by wet early season and subsequent drought. *Clinton:* Great increase in tobacco culture; aggregate yield five times as great as last year. *Henry:* Depreciated by early frosts; late planted on account of drought. *McLean:* Injured by extreme wet weather. *Anderson:* Average. *Livingston:* Well saved; not frosted.
OHIO.—*Medina:* Leaves somewhat eaten by grasshoppers, preventing their use as cigar-wrappers.
INDIANA.—*Dubois:* Shortened greatly by drought. *Ripley:* Somewhat frosted. *Brown:* Increased acreage; late planted; considerably frosted. *Edwards:* Good in spite of worms.
WISCONSIN.—*Clark:* Damaged by wet spring and early frosts. *Adams:* Injured by early frosts.
MISSOURI.—*Moniteau:* Badly frosted. *Clinton:* Increased acreage, but some of it injured by early frosts. *Howard:* Injured by frost. *Carroll:* Early planting fine; late, damaged by frost. *Franklin:* Much injured by worms. *Stone:* Full 25 per cent. above last year in yield, but nearly worthless, having taken a second growth. *Cass:* Frost caught most of the tobacco.
KANSAS.—*Labette:* Experimental crops promising.
CALIFORNIA.—*Alameda:* Not extensively grown, but under a new method of treatment it is thought to be equal to Havana.
OREGON.—*Tillamook:* Growth small, but quality excellent.

FRUIT.

MAINE.—*Cumberland:* Short crop of apples, owing to freezing last winter, and to an extensive yield last year. *Sagadahoc:* Almost a failure; a hard blow in September took off half the apples left on the trees; pears very fair. *Androscoggin:* Grapes above average; apples a failure; pears light. *Piscataquis:* Apples a very small crop; largely blown off by the September gale.
NEW HAMPSHIRE.—*Carroll:* Cider $10 per barrel. *Hillsborough:* Apples few; pears abundant; grapes a fair crop.
VERMONT.—*Caledonia.*—In the west of the county the crop is double last year's; in the central and eastern portions but half as great. *Franklin:* Apples better than expected; choice varieties scarce, but cider-apples plenty.
MASSACHUSETTS.—*Berkshire:* Grape-crop full; the valuable varieties have ripened

finely; the dryness of the soil has operated favorably: good cultivation has been repaid in the apple-crop; pears abundant and good. *Franklin:* Apples worth $4 per barrel. *Norfolk:* Apples a fourth of a crop; pears a larger crop than for several years.

CONNECTICUT.—*Windham:* Apples very scarce; know of no orchard producing a tenth part of a crop; pear-crop never better.

NEW YORK.—*Yates:* Good yields of apples in some quarters; pears not well matured, though above average in quantity. *Seneca:* Apple-crop small; pear-crop large. *Tioga:* Grapes good, but short; apples ditto; pears good. *Erie:* Apples well harvested and closely sold up at $1.50 to $2 per barrel. *Columbia:* Apples scarce and poor. *Cattaraugus:* Apples frozen on the trees. *Albany:* Grapes and pears fine. *Ontario:* Fruits well ripened. *Wyoming:* Grapes ripened well; apples good, but short; pears plenty, it being the bearing season.

NEW JERSEY.—*Hudson:* Grapes injured by drought; apples, hardly a half crop; pears more abundant than usual, the late varieties being the best. *Gloucester:* Complaints that fruit does not keep well. *Warren:* Apples short.

PENNSYLVANIA.—*Bucks:* Apples a light crop, except a local variety, Smith's Cider, which has greatly enlarged the yield. *Jefferson:* Such apples as were not blown off are generally sound. *Armstrong:* Apples fell off badly, yielding a short winter supply. *Northampton:* Apples few; picked but 10 barrels where last year I got 133; trees badly winter-killed. *Cumberland:* Grapes, apples, and pears almost a failure. *Northumberland:* Apples about one-tenth of an average; pears three-fourths; trees secured to stand winter better than any other fruit; grapes, one-tenth average.

DELAWARE.—*Kent:* Grapes never finer.

MARYLAND.—*Dorchester:* Grape-culture reliable and profitable. *Baltimore:* Fruit not so abundant as last year; grapes did better than other kinds.

VIRGINIA.—*Warren:* Grape-crop fine; culture increasing. *Bland:* Apples killed by frost when in bloom. *Madison:* Apples good and abundant in the mountainous region of the county. *King and Queen:* Grapes, apples, and pears did not fulfill their early promise. *Pittsylvania:* Many pear-trees killed by blight. *Orange:* Apple crop fair, though drought caused many to fall. *Northumberland:* Apples frosted in April; some have secured second crops, in other cases the third set of blossoms have appeared. *Page:* Apples better than for three years. *Goochland:* Apples and pears good crops. *Accomac:* Our usual shipment of dried-peaches amounts to about $150,000 per annum; this year but one-fourth of that amount. *Cumberland:* Grapes and peaches injured by excessive rains; apples hold their own. *King George:* Apples not abundant; pears scarce; grapes defective, the Catawba alone proving successful. *Highland:* Apple-crop slender. *Floyd:* Fruit a failure through spring frosts; cranberries grew spontaneously in some places at the rate of 5 barrels per acre. *Greenville:* Apple-crop small; matured too early. *Patrick:* Cranberries would do well. *Dinwiddie:* Apples injured by spring frosts; pears 5 per cent. better than last year.

NORTH CAROLINA.—*Person:* Half crop of inferior quality. *Chowan:* Grapes short; apples almost none. *Craven:* Fruit materially damaged by cold spring and excessive rains. *McDowell:* Apple-crop short. *Ashe:* Cranberry-crop better than usual in quantity and quality. *Martin:* Grapes a failure; apples short; native pears above average.

SOUTH CAROLINA.—*Lexington:* Fruit-crop generally a failure.

GEORGIA.—*Towns:* Apples and peaches almost entirely failed. *Marion:* Apples, grapes, and pears below average; ravaged by insects. *Whitfield:* Grapes a full average and fine; apples generally injured by curculio or some other insect. *Johnson:* Fruit prematurely shed.

FLORIDA.—*Manatee:* Orange-trees badly injured and 25 per cent. of the fruit fallen off. *Putnam:* Lemons average; olive does well.

MISSISSIPPI.—Blight very destructive to several varieties of pears, especially Le Curé, Belle Lucrative, Bartlett, &c.; apples short.

TEXAS.—*Hamilton:* Fruit of all kinds a failure, even the hardy Mustang grape. *Titus:* Apple and pear culture increasing. *Victoria:* Grape-crop small but excellent; pears a new crop, but of fine flavor. *Burnet:* All fruits frost killed in the spring.

ARKANSAS.—*Sebastian:* Fruit destroyed by late spring frosts. *Boone:* Fruit largely destroyed by spring frosts; Concord grapes did well, but no others.

TENNESSEE.—*Dickson:* Apples and pears destroyed by spring frosts. *Hickman:* Apples and peaches almost a total failure. *Grainger:* Poor fruit year. *Meigs:* Fruit almost an entire failure through late spring frosts. *Obion:* Almost a failure. *Wilson:* Grapes, apples, and pears damaged by spring frosts; almost a failure in low lands. *Blount:* Apples a failure; pears none. *De Kalb:* Fruit a failure. *Greene:* Apples a blank failure. *Marion:* All fruits killed by late frosts. *Putnam:* Grapes nearly all fell off. *Bradley:* Fruit almost a total failure.

WEST VIRGINIA.—*Mercer:* Winter apples very scarce. *Jefferson:* Apples fair. *Braxton:* Apples below average. *Monongalia:* Apples short and not keeping well. *Harrison:* Apples very defective; more than half worm-eaten; winter apples will not keep well.

KENTUCKY.—*Hardin:* Grapes a failure; apples a fourth of a crop and full of worms.

Shelby: Apples mostly fell from the trees. *Adair:* Apples and pears almost failures. *Marion:* Apples and peaches failed. *Nicholas:* Apples scarce. *Clinton:* Small crop of apples. *Henry:* Apples and pears almost failures. *McLean:* Fruit a failure. *Logan:* Apples and pears nearly failures. *Fayette:* Grapes rotted badly; apples mostly fell from the trees; winter apples in small supply. *Anderson:* Grapes badly rotted; apples and pears average. *Larue:* Fruit a failure. *Jackson:* Fruit nearly a total failure.

OHIO.—*Fulton:* Apples about average in quantity and quality. *Franklin:* Fruit-trees stripped in the spring by a black measuring-worm. *Medina:* Fruit a great failure. *Wood:* Largest yield and best quality of apples ever known; fruit smooth; sold at $2.50 per barrel. *Lorain:* Grapes largely winter-killed; pears greatly blighted; trees in some cases stripped by grasshoppers. *Crawford:* Grapes and apples winter-killed: pears very poor; many pear-trees blighted. *Wyandot:* Apples fell off greatly; short crop. *Sandusky:* Apples better than for many years. *Lawrence:* Apples abundant and fine. *Hamilton:* One-fourth of the pear-trees destroyed by blight of last year. *Perry:* Some varieties ripened but little of their fruit; this attributed to the wet spring; apples very scarce; pear-trees generally well loaded with good fruit. *Mercer:* Pear culture growing in favor.

MICHIGAN.—*Mason:* Apples and pears never better; grapes not so plenty, but very fine. *Lapeer:* Grapes large yield of the best quality; apples excellent, but not so abundant; pears, a fair yield of the best quality. *Hillsdale:* Apple-crop worth $100,000. *Calhoun:* Grapes a good crop, and ripened well where the vines had escaped injury. *Gratiot:* Huckleberries and cranberries abundant in the swamps and marshes. *Montcalm:* Many apple and pear trees dead and dying. *Oakland:* Apples scarce and inferior. *Antrim:* Apples and grapes abundant and good; pears extra nice, equal to California pears; a few peaches. *Berrien:* Grapes so abundant that only half the crop was saved; apple and pear crops heavy and good. *Livingston:* Apples few and wormy.

INDIANA.—*Owen:* Grapes badly winter-killed; remains of the crop closed out by hot, damp weather and insects. *Marion:* Fruit nearly all winter-killed. *Montgomery:* Fruit mostly a failure. *Gibson:* Apples badly rotted; peaches winter-killed. *Hamilton:* Fair crop of apples, but not of the best quality. *Morgan:* Fruit scarce, knotty, and wormy. *Dearborn:* Almost a total failure. *La Porte:* Grapevines largely winter-killed; apples and pears injured by drought and blight. *Floyd:* Apples a failure; grapes badly mildewed.

ILLINOIS.—*Kankakee:* Apple-trees badly winter-killed; lightest crop for years; quality fair. *Fayette:* Apples nearly a failure. *Madison:* Half crop of grapes; apples above last year. *Pike:* Grapes nearly all winter-killed except Concords, which yield a fair crop; apples scarce and poor. *Whiteside:* Apples and pears almost nothing. *Bureau:* Grapes half a crop, of good quality; apples a fourth of a crop, and generally small. *Perry:* Fruit mostly a failure. *Sangamon:* Fruit largely winter-killed. *Cumberland:* Grapes and apples mostly, and pears entirely failed. *Henry:* Apples mostly a failure. *Cass:* Fruit of all sorts almost a failure. *Edwards:* Apples almost none. *Grundy:* Fruit-trees badly winter-killed. *Hancock:* Fruit badly winter-killed and injured by storms. *Macon:* Some varieties of grapes good; apples a failure. *Boone:* Apples a light crop. *Clinton:* Apples not good. *Douglas:* Fruit almost a total failure; trees largely winter-killed.

WISCONSIN.—*Dodge:* Apples with many trees destroyed by May freeze. *Monroe:* Cranberries almost equal to last year, though injured by early frosts; this culture increasing. *Walworth:* Grapes short and of poor quality. *Green Lake:* Orchards terribly injured by the cold of last winter; blight fast destroying pear-trees. *Washington:* Some orchards did well, others poorly; very few pears; I gathered from trees from 16 to 24 bushels, each, snow-apples, Tolman's sweet, greenings, &c.

MINNESOTA.—*Steele:* Vines and trees injured greatly by last winter's cold. *Carver:* Grapes would have been average but for winter-killing.

IOWA.—*Decatur:* Less than half a crop; some orchards good, others no yield at all; pears badly blighted. *Harrison:* Grapes injured by grasshoppers. *Montgomery:* Grapes injured by drought. *Hardin:* Apples fell off badly. *Louisa:* Apple-crop small and inferior. *Guthrie:* Apples scarce and poor; worth $2 per bushel.

MISSOURI.—*Caldwell:* Apples a short crop. *Platte:* Apples very poor. *Holt:* Fruit winter-killed; first failure of apples in thirteen years; south part of the county brought a fine crop. *Clay:* Apples and pears shortened by drought. *Texas:* Grapes half a crop, and rotted before ripening. *Montgomery:* Apples small and falling off before maturity. *Perry:* Grapes badly rotted. *Phelps:* Grapes badly mildewed and rotted; apples frosted on low lands. *Cass:* Very wormy apples; large pear-trees nearly all blighted. *Franklin:* Grapes, none; apples, very few. *Laclede:* No apples. *Newton:* No apples worth naming. *Cole:* Only hardy varieties like the Concord fruited.

KANSAS.—*Miami:* Concord grapes stung by some unknown insect; peaches winter-killed; apples short. *Leavenworth:* We had no apples worth counting. The State society took some premiums in the East, but it was a mere "trick of business." They solicited a few good specimens from young orchards in favorable localities and artfully

showed them up. In truth our apples are very knotty and poor, and not one-tenth of a product; not one-fourth of a supply for the people here. *Montgomery:* Grapes do well; very few bearing apple or pear trees; young orchards look well. *Riley:* Suffered from sun-scald; apples and pears nearly a failure.

NEBRASKA.—*Pawnee:* Fruit did not fill well on account of drought. *Nemaha:* Fruit-crops good. *Otoe:* Apples half average; pears a good average.

CALIFORNIA.—*Tuolumne:* Grapes nearly gathered; short, but good. *San Luis Obispo:* May frosts made great havoc with fruit-crops. *Contra Costa:* Vineyards greatly curtailed in production by the desiccating north winds.

OREGON.—*Grant:* Many young orchards just coming into bearing; a large annual increase in fruit products may be expected hereafter. Fruit does remarkably well, though late peaches were cut by early frosts. *Tillamook:* A few varieties of grapes; apples excellent, and crops enormous.

UTAH.—*Kane:* Fruits generally scarce, but good in quality, especially winter apples; best varieties, Rawle's Jannet, Spitzenburg, and Limber Twig. *Morgan:* Apple-trees have commenced bearing well, after being swept for five years by grasshoppers. *Iron:* Fruit destroyed by spring frosts. *Weber:* Fruit abundant and excellent; grape culture increasing; its success demonstrated. *San Pete:* Grapes a good yield, but of inferior quality; apples never so good; pears very good. *Salt Lake:* Apples almost a total failure; apple and pear trees much infested by worms; loss from the depreciation of these crops, $200,000.

IDAHO.—*Ada:* Fruit injured by frosts; few orchards yet bearing.

NEW MEXICO.—*Doña Ana:* Fruit and grapes destroyed by frosts last April, a thing which never occurred before in this valley. *Thurston:* Good apple year; selling at 50 to 75 cents a box; pears always good; Seckel selling at $1.25 per box.

Table showing the yield of the crops, &c., on the 1st day of November, 1873.

States.	CORN.		POTATOES. (*Solanum tuberosum.*)		POTATOES. (*Batatus edulis, sweet.*)		TOBACCO.		HAY.		BEANS.
	Product compared with last year.	Average quality compared with last yr.	Product compared with last year.	Average quality compared with last yr.	Product compared with last year.	Average quality compared with last yr.	Product compared with last year.	Average quality compared with last yr.	Product compared with last year.	Average quality compared with last yr.	Product compared with last year.
Maine	70	81	82	109	.....	.....	.....	.....	108	109	85
New Hampshire	95	99	103	110	.....	.....	100	118	110	106	98
Vermont	91	91	122	125	.....	.....	80	110	88	114	122
Massachusetts	99	100	101	110	.....	.....	92	120	88	103	100
Rhode Island	101	98	90	106	.....	.....	.....	.....	82	100	101
Connecticut	90	97	101	116	.....	.....	97	133	96	106	98
New York	92	91	95	99	.....	.....	100	97	93	104	101
New Jersey	86	94	102	97	86	93	.....	.....	106	98	104
Pennsylvania	84	86	95	95	95	96	70	95	102	98	100
Delaware	90	95	100	100	60	85	.....	.....	100	100	100
Maryland	89	89	96	94	86	96	94	106	116	99	98
Virginia	106	100	106	106	103	101	102	101	125	104	107
North Carolina	88	95	92	96	98	97	86	88	105	99	96
South Carolina	87	93	104	102	116	107	.....	.....	130	101	97
Georgia	101	98	102	100	114	108	98	101	111	105	103
Florida	110	106	125	106	110	105	.....	.....	106	111	.....
Alabama	95	100	116	104	112	105	98	101	123	110	100
Mississippi	85	92	99	97	102	104	.....	.....	105	98	100
Louisiana	99	92	97	100	100	97	.....	.....	102	108	.....
Texas	75	82	92	101	125	112	100	106	160	122	120
Arkansas	90	90	103	98	106	102	108	98	104	102	107
Tennessee	91	92	97	97	101	99	95	97	115	102	96
West Virginia	101	99	93	102	107	100	129	96	114	105	105
Kentucky	96	96	81	95	98	101	95	95	96	101	97
Ohio	89	85	78	95	96	98	97	94	95	98	98
Michigan	83	90	100	104	86	92	.....	.....	87	99	96
Indiana	78	82	80	108	94	97	96	94	104	98	97
Illinois	61	85	57	81	86	95	101	100	91	101	86
Wisconsin	77	90	95	96	.....	.....	79	87	90	99	95
Minnesota	90	95	75	96	.....	.....	.....	.....	105	109	94
Iowa	72	83	40	82	77	88	.....	.....	105	103	84
Missouri	68	79	58	83	81	92	80	91	100	103	83
Kansas	69	79	46	78	101	97	114	102	93	108	75
Nebraska	60	73	40	69	76	91	.....	.....	95	103	67
California	98	100	96	91	88	93	.....	.....	115	97	90
Oregon	106	95	103	98	.....	.....	100	106	133	103	106

Yield of the crops, &c., on the 1st day of November, 1873—Continued.

States.	PEAS.	BUCK-WHEAT.	FLAX.	COTTON.		SORGHUM.	SUGAR-CANE, (not sorghum.)	GRAPES.	APPLES.	PEARS.
	Product compared with last year.	Product compared with last year.	Product compared with last year.	Indicated product compared with last year.	Indicated product (lint) per acre, *in pounds*.	Product compared with last year.	Indicated product compared with last year.	Product compared with an average crop.	Product compared with an average crop.	Product compared with an average crop.
Maine	91	85	.....	.....	.....	.....	.....	90	45	70
New Hampshire	99	95	.....	.....	.....	.....	.....	99	49	107
Vermont	102	116	.....	.....	.....	.....	.....	99	72	103
Massachusetts	95	108	.....	.....	.....	.....	.....	101	33	107
Rhode Island	100	.....	.....	.....	.....	.....	.....	114	53	97
Connecticut	96	100	.....	.....	.....	.....	.....	104	34	103
New York	97	106	87	.....	.....	.....	.....	96	64	112
New Jersey	97	104	.....	.....	.....	.....	.....	87	64	106
Pennsylvania	96	94	95	.....	.....	.....	.....	60	48	72
Delaware	75	85	.....	.....	.....	75	.....	115	50	100
Maryland	.....	95	.....	.....	.....	.....	.....	90	56	73
Virginia	101	111	96	.....	.....	95	.....	94	79	88
North Carolina	97	100	98	98	159	92	.....	71	47	67
South Carolina	115	.....	.....	92	188	91	90	62	43	53
Georgia	108	.....	.....	97	184	92	112	83	69	83
Florida	98	.....	.....	97	126	.....	94	91	.....	.....
Alabama	106	.....	.....	91	151	103	118	99	84	89
Mississippi	99	.....	.....	85	172	85	95	90	80	92
Louisiana	108	.....	.....	80	180	.....	107	95	93	83
Texas	123	.....	.....	112	221	110	106	79	75	61
Arkansas	101	.....	.....	102	194	108	.....	84	75	84
Tennessee	95	110	98	102	190	101	95	52	28	40
West Virginia	100	98	99	.....	.....	96	.....	88	73	84
Kentucky	94	97	95	.....	.....	89	.....	78	48	50
Ohio	100	88	82	.....	.....	85	.....	54	51	72
Michigan	99	89	.....	.....	.....	74	.....	96	76	82
Indiana	96	84	84	.....	.....	79	.....	59	52	57
Illinois	92	57	88	.....	.....	82	.....	55	33	44
Wisconsin	98	66	106	.....	.....	55	.....	74	63	64
Minnesota	90	82	111	.....	.....	90	.....	82	67	.....
Iowa	90	53	188	.....	.....	75	.....	70	48	64
Missouri	87	61	108	.....	.....	82	.....	63	55	50
Kansas	77	56	160	.....	.....	89	.....	68	53	65
Nebraska	72	40	63	.....	.....	78	.....	90	76	91
California	98	102	.....	.....	.....	.....	.....	78	87	87
Oregon	96	105	100	.....	.....	.....	.....	86	155	147

EXTRACTS FROM CORRESPONDENCE.

ERRORS OF THE CENSUS.

Blount, Ala.—I am in receipt of the "Statistics of Agriculture," (census.) It is a work in which I feel much interest, and if full reliance could be placed in its accuracy it would be of much value. But, judging from those matters of which I have some personal knowledge, particularly in this county, I am constrained to infer that many of the returns are unworthy of credit. For instance, Table IV, page 95, shows 20,319 bushels of spring-wheat raised in this county in 1872. This is utterly untrue. I have lived in the county upward of twenty years, and if a single bushel of spring-wheat has been raised in it during all that time I have never heard of it. I am very anxious to get a sample of spring-wheat to experiment with, but know not where to obtain it. I think it would suit our climate. Fall or winter wheat, sown in the spring, sometimes does well here.

The value of "orchard products" ($3,239) returned in the census must be far below the reality. In the number and size of farms given there are very grave errors: the unimproved land is, in the main, put down twice. In respect to wool, the low average clip per head in the Southern States may be accounted for in part from the fact that it is the custom to shear twice during the year, and the *spring clip alone* was on hand when the census was taken, and that was all that could be estimated as the product of that year. Hence only about half of the wool in the Southern States is embraced in the census returns for 1870. The sheep having been shorn in the fall of 1869, the spring clip of 1870 was necessarily short—not more than 50 or 55 per cent. of the wool product of the year.

WOOL PRODUCT DECREASED BY SEMI-ANNUAL CLIPPING.

Blount, Ala.—The shearing of sheep twice a year diminishes the amount of wool, as I have satisfied myself by experiment. One fleece annually shorn in the spring will weigh more than both the fall and spring fleeces from the same sheep.

ROOT CROPS FOR STOCK.

Franklin, Vt.—The cultivation of roots for stock is on the increase; crops very fine; mangolds better than turnips.

WORN-OUT LAND RECLAIMED.

Russell, Ky.—In 1869 I purchased a farm on the Cumberland River. It had been cultivated in corn without rest for from fifty to seventy years, and was badly worn. It did not, in 1869, produce over 20 bushels per acre. A portion of it was not planted, as it was thought that it would not pay expenses of cultivation. A 35-acre field, one-half of which was not considered worth planting, I turned over, plowing 7 inches deep. In the spring sowed oats and clover; pastured my clover too close and had no sward to turn under. Last winter turned up 8 inches deep; in the spring cross-plowed with long bull-tongue, running 8 or 9 inches deep. Planted in corn 1st to 4th of May, 3 feet by 4; thinned to two stalks in the hill. Did not plow as often as I would have done, on account of the rains in June, but plowed three times, last plowing with bull-tongue, as deep as I could well do. As the result, I am now gathering from one-half the field 65 bushels per acre, from the other half have gathered something over 50 bushels. An adjoining farm of 200 acres, all in corn, has not raised as much as my 35 acres. So much for clover and deep plowing. I am confident that within a few years I can make my farm produce 75 to 80 bushels per acre, with no other fertilizer than clover and deep plowing. Break deep, and plow deep, and when your corn is young.

CEREALS IN ARIZONA.

Mohave, Ariz.—Experiments have been tried in raising grain and sorghum with fair success. During 1874 a large acreage of grain will be grown, besides large vegetable gardens.

LAND RECLAMATION.

Contra Costa, Cal.—The rapid progress made in reclaiming the overflowed, and in irrigating the hitherto considered barren lands, opens the most extensive field for profitable and varied culture to be engaged in under favorable conditions.

AGRICULTURAL SPECIALTIES.

Baltimore, Md.—Dairying and gardening are our specialties; fine dairies near Baltimore, and along the railroads large quantities of milk are daily sent to that city; an improvement of cows is noticed; the business pays well.

Orleans, Vt.—The leading industry is dairying. In this town (Craftsbury) there are 600 cows; there are nineteen towns in the county, some of which have an equal or greater number. I estimate the total number at 9,000, averaging 150 pounds of butter per cow, and making a total product of 1,350,000 pounds. It sells at 30 to 35 cents per pound, but at an average of 25 cents it amounts to $325,000, an aggregate greater than any of the crops except hay.

GOOD AND BAD CROPS.

Hancock, Ind.—Last year the best crop year I have ever known in this county; this year the worst.

COMMERCIAL FERTILIZERS.

Laurens, S. C.—Last spring the farmers bought vast quantities of guano, expecting to pay for it by the 1st of November with cotton at 17 and 18 cents per pound, but as cotton only commands 12 cents they feel much discouraged. It is generally believed that the most of this guano is swamp muck or alluvial soil.

Lunenburgh, Va.—Nearly all depend on manufactured fertilizers. These are applied mostly to the tobacco crop, to be followed by wheat, and then by corn or oats, and then one or two seasons uncropped. The amount of money going out of the county, from the best information I can get, will nearly or quite equal the profits of the crops. Could the money be expended in labor, in the feeding and care of cattle and sheep, and the making of stable and yard manures, it would largely increase the productiveness of the lands.

IMMIGRATION OF FARMERS.

Baxter, Ark.—This county is filling up with northern farmers, who are quite welcome; they are good farmers, and seem to be well pleased with the country.

EPIZOOTY.

Boone, Ill.—Epizooty not so general as last year, but more serious. Discharge from the nostrils more copious; head, glands, &c., severely swollen.

CATTLE FATALLY DISEASED.

Jefferson, W. Va.—Two or three cattle died from what is called "mad itch," caused, as is supposed, by eating corn-stalks that had been chewed by hogs.

RAISING SHEEP AND LAMBS.

Orange, Va.—Much attention has of late been paid to sheep husbandry, more with a view to raising lambs than wool. Very many common sheep have been introduced recently and bred to fine bucks.

EARLY WINTER FEEDING.

Tazewell, Ill.—Farmers beginning to feed cattle earlier than for thirty years.

SCARCITY OF MONEY.

Miami, Kans.—No money in circulation; the county verging upon bankruptcy; from 500 to 700 farms mortgaged at high rates of interest, (20 per cent.;) farmers generally despondent.

BAD SEASON FOR RICE.

Georgetown, S. C.—The season has been most disastrous to our specialty, rice. The heavy rains of August and September were so slow to run off that the swollen rivers delayed harvest four weeks. Rice cut and stacked in the field was almost a total loss. That uncut became over-ripe and tangled so as to cause great waste in harvesting. The loss will be 40 or 50 per cent., while the quality will be poor.

GOOD CROP OF RICE.

Clinch, Ala.—Rice-crop very good; average yield of uplands 20 bushels per acre.

CUBA TOBACCO.

Gadsden, Fla.—Prior to the war the Cuba tobacco was cultivated as a staple market crop, the annual product of the county amounting to about 4,000 boxes of 400 pounds

each, and commanding at the barns prices ranging from 20 to 80 cents per pound, according to quality. This is emphatically the "poor man's crop;" in numerous instances it has so proved itself requiring but a small acreage and little money. Every child six years old may be profitably employed on this crop, which is subject to none of the casualties of cotton. It will probably resume its former position of a *staple* crop.

DRY SEASON.

Hancock, Me.—The season from planting to harvesting has been one of as little rain as ever was known; many wells have been dry for months that were never dry before.

UNHEALTHY WEATHER.

Alamance, N. C.—Chills prevailing more than any year since 1846, owing to excessive wet and rank vegetation.

LARGE NUT CROP.

Braxton, W. Va.—Hogs getting fat on acorns. A very large crop of chestnuts, which the merchants are buying and shipping largely.

Fayette, W. Va.—Immense mast this year, and hogs make good pork on it without any corn. Millions of pigeons, however, are devouring it.

EARLY SNOW.

Schoharie, N. Y.—Snow on the highlands 12 to 15 inches deep on October 7; the rest of the month fine weather.

Steuben, N. Y.—Cold rain and snow October 19; ice October 22.

Erie, N. Y.—Snow 3 inches deep October 29.

Lewis, N. Y.—October 31 one inch of snow; soon disappeared.

Cattaraugus, N. Y.—Snow 3 or 4 inches deep October 20; snowing very fast to-day, November 1.

Lawrence, Pa.—Considerable snow October 27, 28, and 29.

Campbell, Tenn.—Cumberland Mountains covered with snow October 28.

Kanawha, W. Va.—Frost September 15; snow over 3 inches October 21.

Randolph, W. Va.—Great snow-storm, commencing October 19; snow fell from 24 to 30 inches deep and passed off without frost; considerable damage to fruit-trees and other timber.

Ottawa, Ohio.—Snow 5 inches deep October 21, with ice a quarter inch thick in shallow water.

Vinton, Ohio.—Snow 7 inches (the heaviest ever known at this season) October 21; two-thirds of it melted as it fell.

Jackson, Ohio.—Snowed 8 inches October 21.

Coshocton, Ohio.—Snowed 6 inches October 21.

Highland, Ohio.—Nearly a foot of snow October 21.

Holmes, Ohio.—Snow from 6 to 10 inches October 12. The timber, being full of green leaves, was badly broken down.

Ottawa Mich.—Frosts from September 20 to November 1 almost every night. First snow October 2, lasting six days; November 1 about 6 inches on the ground.

Livingston, Mich.—Ten inches snow.

Clark, Wis.—Snow October 24, 10 inches deep.

Dunn, Wis.—Eight inches snow October 25; sleighs used the last few days about as much as wagons.

Outagamie, Wis.—Snow-storm October 25; 12 inches on the ground.

EXPERIMENTS IN TREE-CULTURE.

Sedgwick, Kans.—Chestnuts, hickory-nuts, and acorns summer-killed the first season I intend to plant under other trees for shade. If that will not do, we must give up raising hard timber. Soft timber does well.

SUCCESS WITH CASTOR-BEANS.

Wilson, Kans.—Many farmers planted castor-beans last spring, and though the season has been very unfavorable the returns have been far greater that from corn, or, in fact, from almost any other crop grown here.

SUCCESS IN MANUFACTURING BEET-SUGAR.

Alameda, Cal.—The Alvarado Beet-sugar Manufactory, in this county, is making a fine article of sugar, and is worked up to its full capacity, with ready sale for its products.

PRODUCTION OF HEMP.

Mercer, Ky.—Hemp raised to a considerable extent; our best land will yield 1,000 pounds per acre. It is our best crop when prices will justify it, say from $5 to $8 per 112 pounds. It cannot be raised for less money. Only our best land will grow it. For the last year prices have been so low, and the expense of handling so great, that there has been no profit in it.

IMPORTANCE OF A JUDICIOUS SELECTION OF SEED.

BY THE COMMISSIONER OF AGRICULTURE.

Through the medium of an essay read before the Agricultural and Mechanical Association of Gadsden County, Fla., by the Hon. C. H. Dupont, I desire to impress upon the farmers and planters of the country the great importance of a proper selection of seed. The essay is given in a plainness of language and with a force of expression which must command the assent of every reader, and perhaps induce the practice of what is so sensibly enforced. The planter is apt to conclude that selection gives too much trouble; but that trouble is the work of the farm, and what work can be so profitable? But there is another injunction which should accompany the precepts of this valuable essay: that crops of grain, cotton, or tobacco must be rotated by grass, peas, rye, or other vegetable crop turned into the ground. It is one of the provisions of nature, that the growing product of the soil itself is essential to its continued life and powers of reproduction. While artificial manures and mercantile stimulants may force production for a time, their ultimate consequence, without the addition of growing vegetation, is debility and death.

The following is Mr. Dupont's essay:

It is a law of physical nature, as universally applicable to the vegetable as to the animal kingdom, that "like produces like." The recognition of the law is not merely theoretical or speculative; it is of universal acceptance, and its existence has been attested by long experience and the most critical observation. The judicious stock-raiser gives his testimony as to his belief in its existence when he consents to pay fabulous prices for what he denominates "pure blood," whether it be of horses, cattle, sheep, or swine. So universal is this belief among mankind, that he would be set down as a fool or a madman who should essay to rear a first-class racer or trotter from anything short of a "thorough-bred" on the side of both sire and dam.

It may, however, be asked, if this be a *law*—fixed, absolute, and universal—how happens it that differences in color, form, power of endurance, and fleetness almost invariably exist between the individual produce of the same sire and dam; and this query may be propounded as an argument to establish an *exception*, which is contrary to the essential quality of a "*law*," the idea and definition of the same being fixedness and universality. But the querist gains no aid to his doubt when he is informed that there is another law governing the procreation of all animals, which is denominated "breeding back." It is established beyond all cavil, by the experience of the most critical observers, that where there exists the slightest *taint* of blood in the original stock, although it may have lain dormant for several generations, yet in the course of time it will be apt to show itself in some individual of the family. This is particularly observable in the breeding of that noblest of the lower animals, the horse, and if credit is to be accorded to the statements of some of the most reliable medical authors, even man himself is not exempt from the operation of this latter law. Well-attested cases are cited, where the *taint* of African blood, after laying dormant for two or three generations, has at last exhibited itself in some member of the family by a marked development of all the physical characteristics of that particular race. A little reflection will lead to the conclusion that these differences in the progeny, so far from impinging on the law as laid down, only add strength to the announcement of its universal existence.

But these differences may arise from causes other than a taint of blood in the original stock. It is a plausible supposition that in the matter of *color*, this may be greatly influenced by the imagination at the instant of procreation; as to the other differences named, they are beyond the scrutiny of human observation. Much doubtless is dependent on the condition of the parents in point of bodily health and vigor, and not a little on the after rearing of the progeny. That differences in the qualities of the progeny of the same parents do exist is undeniable, but that these differences constitute *exceptions*, which so weaken the rule as to deprive it of the essential qualities of a *law*, is not admitted. Hence, then, the very great care observed by the raisers of blooded

stock, to *select* as breeders from particular parents those of their progeny which show the finest points of excellence and the closest resemblance to the original stock. It is only by such judicious *selection* that the blood can be kept at its original standard of purity; any neglect in this matter would inevitably result in a speedy degeneration.

Reverting to the premise laid down in the beginning, we re-assert that the physical law previously announced is as applicable to the vegetable as to the animal kingdom. If this be true, how very important is it that the agriculturist, upon whom exclusively the population of the earth is dependent for an adequate supply of food and raiment, should give the utmost care and attention to a judicious *selection* of the seeds from which his crops are to be realized. And yet, in our highly favored South, favored beyond any other land in the fertility of her soil, the geniality of her climate, and the equability of her seasons, how criminally neglectful are our farmers and planters in regard to this very important point. To illustrate the extent of this neglect, it is only necessary to advert to the programme observed on the great majority of our farms and plantations. In this review I shall confine myself to cotton and corn, the two great staples of Southern industry.

In the matter of cotton, the chief anxiety of the planter is to save the present, with no reference to the production of future crops. The cotton is picked from the boll as expeditiously as possible, often even without reference to the state of the weather, and thrown indiscriminately into one pile in the gin-house, there to remain until it may be convenient to start the gin. In this pile there is a general commingling and mixture of the bottom, middle, and top crops—the good and bad, the matured and the immatured—and from this conglomeration of different qualities is obtained the seed for the planting of the next crop. It is true, that some planters are to be found who have advanced so far in the science of *selection* as to be careful to set apart the picking from the middle crop, (or at least to *give orders* to their agents to that effect,) the seed from which is exclusively used for planting. But even in such cases, in these days of dilapidated gin-houses, demolished scaffolds, and general scarcity and unreliability of agricultural labor, much of the seed of this middle picking is injured by the heating of the cotton in the pile, which invariably generates incipient decay, and to this cause, more than to any other, may be attributed the great prevalence of "bad stands" since the close of the late sectional war.

But supposing that we have discovered in our midst a careful, pains-taking farmer or planter, who does not rely upon the *issuing of orders*, but gives the matter his closest personal attention. He has kept the different pickings separated and apart; designating the best matured and least faulty for seed; he has had it perfectly dried before it is piled in the gin-house; he has had it carefully ginned and the seed set apart, to be used in the planting of the succeeding crop. With all this very commendable care and painstaking on his part, he has nevertheless made only one move in the right direction, and, if he stops there, he may justly be compared to the rickety child who, having accomplished his first step, toddles along through life without ever arriving at the firm, sturdy, and elastic walk of vigorous manhood.

Upon invitation we accompany this exceptional farmer to his well-tilled cotton-field. In our ramble through the luxuriant growth, our attention is arrested by a stock of magnificent proportion and the most perfect symmetry, and literally loaded and bending under the weight of well-formed bolls, in all stages of maturity. This stock is not above medium height, but is of rather bulky proportions. Near the ground it reaches out two long arms, and each of these throws out numerous limbs, which are closely studded with fruit. From the main body or center stock also proceed numerous limbs, gradually diminishing in length as they approach the apex of the plant, so as to form almost a perfect pyramid. These limbs are short-jointed, and to each joint is attached a large and finely developed boll. Upon closer examination we discover no indication of a loss of fruit; the forms have "stuck." Our well-pleased friend views this splendid representative of the royal family of "Old King Cotton" with evident pride and exultation, and, if the truth were known, has doubtless already fixed it in his mind to make exhibition of it at some prospective agricultural fair.

Near by our attention is arrested by a stock of equal proportion and of even greater luxuriance. The same out-reaching arms characterize this stock, and the limbs from the center stock are somewhat longer and equally well jointed. There are conclusive indications that this stock had been prolific in "*forms*," but alas! there are only a few matured bolls to be seen; the early promise of fruit has been blasted by premature "shedding."

In the immediate vicinity of these two representatives of the royal family looms up one of tall and graceful mien; no long arms nor bulkiness despoils it of its majestic air, but trim and lithe in form, it attitudinizes in the passing breeze the "Grecian bend," as gracefully as any well-laced "dandy" in tights. But that is not its only point of resemblance, for upon examining for *fruit* it is to be found wofully deficient and can be classed only as "a cumberer of the ground."

Now these three representatives are faithful types of our friend's entire crop, and his attention being called to the marked differences in *fruitfulness* and the cause inquired for, he very flippantly assigns some essential difference in the elements contained in

the soil in which they were severally grown, and, acting upon that hypothesis, he proceeds to take from the root of each plant a sample of the soil, and forthwith posts it off to the agricultural chemist to be analyzed and reported upon. In due time the report comes back that the analysis has detected no essential difference in the respective samples. (Perhaps if the learned professor had been informed of the *purpose* of the required analysis, he might have been able to have detected a difference, which in fact had no existence.) Our friend being a sensible man, for the first time recognizes the fact that as in the animal so in the vegetable kingdom, there exist different types of the same species, and that for the purpose of propagation a *judicious selection* is as essential in the one case as in the other. Acting upon that conviction he promptly determines to turn over a new leaf in his farming programme, and instead of obtaining seed from the general pile, which has been picked without any discrimination, he marches to the field at the commencement of the picking season, and having previously determined by close observation the *type* to be preferred, he proceeds to pick only such bolls as are fully developed and well matured. To render his work in this new programme perfectly thorough, he uses great discrimination and selects very closely, so that at the termination of the picking season he finds that he has gathered only one hundred pounds of cotton from a field of perhaps one hundred acres. But he is not discouraged by the smallness of his accumulation; he knows that this hundred pounds will yield him two bushels of seed, which will plant a patch of two acres at least; and his experience has taught him the extraordinary progressive increase of all seed plants. He is therefore satisfied with the result, remembering that it is only the *beginning* of a good work.

But just here our farmer friend, adverting to the fact that all the phenomena occurring in the rearing of animals also occur in the rearing of plants, justly concludes that to preserve his seed from degeneration, and to keep it up to its original standard of excellence, it will be necessary to give to the parent stock an ample supply of nutritious food, so as to keep it in good condition and impart to it that healthful vigor so essential to successful propagation. To accomplish that end he resolves to establish a *permanent* "seed-patch," and forthwith commences the collection and application of fertilizers, domestic, (and, if need be, commercial,) until he brings it up to the production of two bales of lint to the acre. In this patch, located somewhat remote from the balance of the crop if practicable, he deposits his two bushels of selected seed, chops it out into bunches of three or four in a place as soon as the plants have put forth the third leaf, carefully avoiding the bruising of the plants left; and when it has put forth its fourth and fifth leaves, thins it out by hand to a stand of one in the hill, taking care to leave those stocks which exhibit the most vigor and greatest tendency to bulkiness of form. The after cultivation is thorough and judiciously applied, the plants advance rapidly to maturity, and about the 1st of July it is *topped* to insure development and maturity to the upper bolls. From these two acres our farmer finds himself the possessor of four bales of lint, and at least one hundred and twenty bushels of selected seed, to be used in the planting of the ensuing crop.

But his work does not end with the first year's selection, for he has discovered the presence of *intruders* in this his agricultural *sanctum*. The burly but fruitless gentleman and the attitudinizing dandy before referred to have again put in an appearance and they must be gotten rid of. He therefore enters upon another selection from his "seed-patch," and repeats it from year to year, until he has effectually *fixed the type* of the original stock, and his heart is gladdened each revolving year by the evidence that his labor has not been uselessly expended in the cultivation of barren interlopers, but that each plant generously responds to his efforts, as a prolific fruit-bearer, and amply repays him for his toil and patient painstaking. The "seed-patch" and "annual selection" become *permanent* institutions in his agricultural programme, to be handed down to his posterity as an inheritance more valuable than evanescent gold. This is the programme of a plain, practical agriculturalist, who is not afraid of the ridicule of being denominated a mere "theorist," or "new-light progressionist," and it is urgently commended to the earnest consideration and adoption of every member of this association.

Having consumed so much time and space on the subject of cotton, I am admonished of the propriety of being as brief as possible on the other branch of the subject—corn. Indeed, it might suffice to say that all the principles announced in regard to the successful growing of cotton hold equally true in regard to the production of this much more important staple. I desire to emphasize the words "much more important," in the face of those who hold the doctrine that it is more remunerative to apply our entire labor to the production of cotton and rely upon the teeming granaries of the West for a supply of that indispensable article. A moment's reflection will show the fallacy of that doctrine, the prevalence of which, to only a moderate extent, has already largely contributed to the existing depression throughout the entire cotton belt. This doctrine is now acted upon to only a limited extent, but should it ever obtain universal acceptation the consequence would be the production of a large *surplus* of cotton at the expense of an entire destitution of corn, thus depressing the price of the former and correspondingly enhancing the price of the latter. How such a result could bene-

fit the grower of cotton is beyond the comprehension of any sane mind; it would be practically the making of *cheap* cotton to buy *dear* corn! Any reform, then, that shall contribute to increase the domestic supply of corn must result in incalculable benefit to the entire population of the South. The inauguration of such reform may be found in a judicious "selection of seed."

To demonstrate the necessity for a reform in this particular it is only necessary to advert to the manner in which the seed-corn is usually obtained. In the fall of the year the crop is indiscriminately gathered and hauled to the crib, and there all, good, bad, and indifferent, is thrown into one pile. It there lies until spring; and a few days prior to the day designated for the commencement of planting, (and more frequently on the morning of that day,) the "hands" are ordered to the crib to *select* "seed-corn." They commence the work, and the first dozen ears that are shucked are found to be "weevil-eaten," and are rejected. The next dozen are found to have the "black-eye," and are also rejected; until at last some one of the "hands" comes across a little "nubbin" which is pronounced *sound*, and that is thrown aside for "seed." Thus the work proceeds until a sufficient quantity for planting the crop has been obtained. The seed has been *selected*, but the only quality deemed essential was *soundness;* the long-grained "gourd-seed," the broad "Tuscarora," the round "flint," without any discrimination, are brought into close juxtaposition. In due time, under the influence of a favorable season, the heart of the farmer is gladdened by the sight of a *good stand*. He goes to work zealously, and by unremitted toil gives his crop the advantage of good tillage until it is brought to full maturity. In the ensuing fall he proceeds to gather the fruit of his labor, and is greatly *disappointed* to find that the yield has not come up to his anticipation, but, with philosophic composure, he consoles himself by attributing the failure to the unsuitableness of the climate, and reiterates the oft-repeated but unfounded assertion that "this is no country for growing corn."

Let not our industrious but mistaken friend be discouraged that Providence has cast his lot in this southern clime, so favorable to the enjoyment of health and long life, and so prolific in the production of the kindly fruits of the earth. Let him for one moment pause and reflect. Let him scan the authentic statistics furnished by the Agricultural Department at Washington, and he will there discover that New England, with her granite hills and three inches of cultivable soil, her cold and rigorous climate, and her short and uncertain seasons—in despite of all these disadvantages—reports a higher *average* in the production of corn than does the far-famed West, the recognized Egypt of this continent, and indeed of the world. It is not any defect in soil or climate that causes him from year to year to reap the bitter fruit of disappointment; it is the absence of that patient painstaking which so eminently characterizes the agricultural operations of the New England farmer. Let our southern farmer and planter emulate this commendable characteristic of the eastern agriculturist. Let him now, this very season, resolve to turn over a new leaf, and, as a first step in the proposed reform, determine to carry into practical effect the recommendations heretofore urged for the improvement of the cotton-seed. This can be done with but little extra trouble by requiring of the hands, in breaking-in the crop, to be careful whenever they come across a stock bearing more than a single ear to cut it off above and below the ears, and, with the ears attached thereto, throw it into the heaps, to be hauled with the same to the crib, where it can be readily separated and kept apart by itself until such time as it may be convenient for the farmer to make the proper selection. Having by this method secured the essential quality of "prolificness," he proceeds to select from this pile a sufficient number of such ears as are recommended by their superior size and excellence of grain, it being a matter of first importance to select a grain that will most effectually resist the attacks of the weevil. These should be put into barrels and the interstices between the ears well filled up with perfectly dry sand or wood-ashes. Thus treated it will be exempt from the inroads of insects and preserved in good condition until the season for planting. In making this selection *uniformity* in the character of the grain ought not to be neglected.

But let not our farmer who has entered upon the path of reformation be content with the result of a *single* experiment. Let him remember that the purpose of selection is not for the benefit of a single crop, but to impart the quality of "fixedness" to a particular "type," and to resist the natural tendency to degeneration. To attain this desirable result he must, as in the case of cotton, make the "seed-patch" a *permanent institution*, from which he may from year to year not only obtain an abundant supply of improved seed for the planting of the entire crop, but be enabled to improve his selections to the very highest point of excellence. When we reflect how small a quantity of corn is required to seed a large area of land, is it not passing strange that this vitally important subject should be so universally neglected? Let this opprobrium no longer rest upon the farmers and planters of Gadsden County, but let them rise to a full appreciation of the needed reform, and then we may hope that ere long dear "old Gadsden," now struggling with the difficulties that environ and oppress her, shall rise like the phœnix from its ashes, and become as noted for the fullness and abundance of her corn-crops as she has heretofore been for the excellence of her Cuba tobacco. Henceforth let *Excelsior* be the agricultural motto of this association.

AGRICULTURE IN THE OLD WORLD.

The following condensed exhibit of a few salient points in foreign agricultural statistics, accompanied with indications of prevailing agricultural tendencies at the present time, prepared by the Statistician of this Department, was read before the New York Rural Club, and is given in connection with more extended statistics of European agriculture, to be printed in this and succeeding numbers of the Monthly Report:

It would be presumption in me, after a hasty glance at the fields and vineyards of a few of the countries of Europe, to attempt a portrayal of even the prominent features of European agriculture. I will only indicate briefly the leading impressions received, supported by a few illustrative facts. Nor do I care to indulge in the egotism of personal adventure, or details of rural description, preferring, as the theme is so broad and the time so short, to epitomize a few of the dominating facts which illustrate the variety, the extent, and the prevailing tendency of rural production, even at the risk of heaviness from the gravity of a freightage of statistics.

As no true American comes in contact with the civilization, the institutions, the politics of Europe, without brightening his patriotism and intensifying his appreciation of home capabilities and attainments, so a view of European agriculture, ripe with the fruitage of time and effort, though almost everywhere displaying parasitic and injurious growth of the fungus of feudalism, only brings into favorable contrast our own agriculture, superior already in the fitness of its mechanism, and in the intelligence of its labor, as in the fertility of its lands, and in the range of its production. While so much may be said of the present, it belongs to the future to refine what is crude, to systematize what is chaotic, to perfect what is primitive. A statistical glance at the conditions and results of agricultural labor in several nationalities will render more intelligent an attempt to compare the status of agriculture of one country with that of another or our own.

Great Britain.—England, Scotland, and Wales, known together as Great Britain, a manufacturing and commercial country, in which but six per cent. of the population are actually employed in agriculture, furnish an example of the cleanest culture, the most rational processes, the most extensive use of money in permanent improvements and in fertilization, and the highest rate of production known to the industry of Europe and of the world. In some of these respects Holland is only exceeded slightly, if at all. While the land is held too tightly in the clutches of the dead and of the titled living, it is gratifying to see that the people are wresting to their own use even the smallest parcels of it. While, according to the official enumeration of 1870, only 46 per cent. of the "holdings" or farms exceed 20 acres each, they occupied 91 per cent. of the total area returned; 28 per cent occupied 20 to 100 acres each, and 18 per cent. above 100 acres each. In 1871 the area cultivated in holdings from one-fourth of an acre to 20 acres was but 1,897,000 acres, out of 30,838,000, or six per cent.; but they carried 11 per cent. of the cattle of the country, and 25 per cent. of the swine. It was found in 1872 that there were 60,944 holdings of one-fourth of an acre to an acre in extent, of which 67,422 were in England, and of that number 49,000 were allotments held by agricultural laborers and workingmen. This practice of alloting land for the use of laborers is making rapid increase.

The total area of Great Britain is 56,964,260 acres, of which England comprises 32,590,397—the whole scarcely equal to the area of two of our Western States of average size. The population to be supported, 26,000,000, is one to rather more than two acres; in England, one to 1½ acres; and yet little more than half of the total area, 31,000,000 of acres, is in cultivation, nearly 24,000,000 of which is in England proper. A key to agricultural prosperity is found in the fact that not exceeding one-third of the occupied area is allotted to exhaustive crops, as the cereals; while two-thirds are given to restorative crops, as roots, clover, and grasses in rotation, and permanent pasture. The proportions last season were, for the whole country, 30.9 per cent. in grain crops, 11.6 in green crops, 14.5 in clover and grasses, and 40.6 in permanent pasture.

The production of meat is the first object of British agriculture; the growing of wheat is the consideration of next importance. Both cattle and sheep are well known to excel all others in meat production, attaining greater weight in a given time than continental animals. The official average of net weight of carcasses of British cattle of all ages is 600 pounds; of cattle imported, 500 pounds; of British sheep and lambs, 60 pounds; of imported, 50 pounds. The present tendency is to the increase of live

stock and the diminution of the live grain area. There has been a decrease since 1856 in the breadth of wheat, oats, peas, and beans, and an increase in barley, roots, clover, and permanent pasture; the reduction in "white crops," which now average 7,500,000 acres, exceeds 1,250,000 acres; wheat now occupying a little more than 3,000,000, or about one-sixth of our wheat area, although the product sometimes exceeds one-third of ours. The decrease has been about 10 per cent. in 29 years, not in product, but in acreage, the yield having increased 1½ bushels, and 5 bushels in one hundred years, being now 28 bushels, the largest national average. The supremacy of turnips has therefore not weakened in the least, and the importance of sheep, which suffered some decline during the area of low prices for wool in 1867, is now steadily advancing. There are now about 28,000,000 sheep to 30,000,000 acres of productive area. It was recently assumed, on good grounds, that one-fourth of the cattle were annually sold, at the rate of £16 each in England, £14 in Scotland, and £10 in Ireland; that one-third of the English sheep and one-fourth of the Scottish are annually sold at about 35 shillings each. The tendency has since been to still higher prices. Not only is the proportion of stock large, both to area and population, but the extra size of animals and extra feeding contribute both quantity and quality to home resources of fertilization, and afford a valid reason for enlarged production.

Holland.—Holland, not including the Zuyder Zee, has an area of 3,287,486 hectares, or 8,123,696 acres; with it, 3,818,529 hectares. It has a population of 3,500,000, constantly becoming denser, having increased 8 per cent. in ten years. Of this number 218,115 men and 35,730 women are actively employed in agriculture. Nearly four-tenths of this area is occupied in pasturage and fodder production, showing the prominence of meat, butter, and cheese in the farm economy of the country. The tilled area is about 25 per cent of the total. The cereal production last reported was about 9,000,000 bushels of oats, nearly as much of rye, and 4,500,000 bushels of wheat. The cattle are the best meat-producers of continental Europe, and in the flocks runs the best blood of English mutton breeds. In all the operations of the dairy, and of the farm as well, the extreme of neatness is the rule. The soil itself, originally a waste of sand, has been reclaimed by patient labor, a part of it literally from the domain of Neptune, and kept in generous productiveness by a liberal application of fertilizers; and now it is proposed to drain the Zuyder Zee, an area of 1,250,000 acres, and transform its bed into fruitful fields, at an expense almost equal to the cost of construction of our completed Pacific railroad line.

Belgium.—The area of this country is equivalent to 7,278,640 acres, of which 6,582,400 are productive, less than 10 per cent. being uncultivated. The population averages 448 to the square mile. The latest principles and processes of culture have been adopted, and agricultural implements and machinery are extensively employed, by co-operation and hire, when too expensive for individual ownership; and the prevalent economy of resources of fertilization is suggestive of Chinese practice, being seen not only in the protection from rain and sunshine of animal manures, but in sweeping up the droppings upon the highways, the collection and pulverizing of the bones of dead animals, and gathering of mud from rivers and canals, and the sewage of towns, while all these and other resources are supplemented by the importation of fertilizers; and thus is this diminutive kingdom, little larger than the State of Massachusetts, made to yield, of cereal grains, not less than 66,000,000 bushels, of which nearly 15,000,000 are wheat, 18,000,000 rye, and 24,000,000 oats. While more than one-tenth of the producing surface is allotted to wheat, (700,660 acres,) and fully as much more to rye, the crop next in extent is hay, followed respectively by oats, green fodder, potatoes, and pasturage. I deduce from official statements that 540,025 acres of hay yielded an average of 1.82 tons per acre, and 432,931 acres in green fodder produced 8.8 tons per acre, and an aggregate of nearly 4,000,000 tons. The breadth of sugar-beets reported is equal to 45,644 acres, and the yield 13½ tons per acre, which is the same rate of production estimated for 70,641 acres of roots for fodder. There are also smaller breadths of spelt, barley, buckwheat, beans, peas, and vetches, and such commercial crops as flax, hemp, colza, hops, tobacco, chiccory, and teasels. In the region known as the Polders, the reclaimed lands protected by dikes, a yield of 32 bushels of wheat per acre is obtained, and yet there is never produced in Belgium a quantity sufficient to meet the wants of its population.

Switzerland.—The Alpine Republic is about the size of New Hampshire and Massachusetts together, containing 16,000 square miles, with but 15 per cent. susceptible of cultivation. The Alpine region includes 57 per cent., and has an average altitude of 8,325 feet. Forests occupy 19 per cent. of the total area. Large farms are only seen in the cantons of Berne and Luzerne, and the arable lands are mostly found between the Jura and the Alps. The grain produced fails to furnish the bread supply, though it should be remembered that 50,000 strangers reside here a portion of the year, and somewhat augment the demand. The wine product is 30,000,000 gallons, and that is insufficient to moisten the home consumption of bread. Cheese is exported, but the imports of butter are greater than the exports. The stock of cattle is little short of one million, very hardy, thrifty, some families considerably improved, and many ani-

nals quite productive in the dairy. The mountain pasture lands are divided into tracts known as *alpages*, 4,759 in number, of which 54 per cent. are owned by individuals, 33 per cent. by communes, 9 per cent. by corporations, and a few by the State. About 150,000 milk cows are pastured, six acres being required for each cow; and a large number of other cattle are kept in these elevated pastures. The agricultural resources of Switzerland bear no comparison naturally with those of Colorado, or almost any equal portion of the Rocky Mountain region, notwithstanding the aridity of our great mountain areas. The abruptness of declivitous surfaces, and the poverty of the soil, in large portions of Switzerland, are in marked contrast to the surfaces and soils of our mountain domain.

Germany.—The German Empire exhibits to the world a miracle of industry and thrift in agriculture. The northern portion from Berlin northward is naturally little better than a desert of sand, and southward the improvement is small and slow until the neighborhood of Dresden is reached. Saxony and Bavaria are the most fertile provinces. Grains, potatoes, sugar-beets, forage-roots yield abundant returns for the patient labor and constant fertilization required; wheat does not equal the yield of England, being at the rate of 17.1 bushels per acre, yet the wonder is that so large a product can be secured. The latest average for rye is 16.7 bushels; for oats, 32.9 bushels. As in Great Britain and other countries, there is a marked tendency to improvement of stock and the increase of meat supplies. Formerly wool was paramount in sheep-husbandry, mutton being altogether subordinate. The original families of Spanish merinoes became founders of a new order of ovine nobility, the Electoral in Saxony, the Negretti in Mechlenburg, and the Electoral and Negretti in Silesia, which became famous throughout the world, ultimately supplying an extensive demand from Australia, from South Africa, and South America, and a more limited demand from the United States, where the American breeders of the same Spanish families commanded the preference of a large majority of wool-growers. Now, the production of fine wool is declining in Germany, and the Southdowns and Leicesters of Great Britain are eagerly sought. The present numbers are reported officially at 29,000,000, of which about 14,000,000 are merinoes and other grades, 7,000,000 of pure or partial English blood, and 8,000,000 of native races. The wool production is estimated at 180,000,000 pounds. It is found that the mutton-breeds are more profitable on the best lands and in the densest populations, while in regions remote from market and sparse in population the merino still maintains its former sway.

The cultivation of the vine has become an extensive rural industry in Germany, requiring the use of 300,000 acres in vineyards in Saxony, Bavaria, the Rhine, and Moselle Valleys, and other portions of Southern and Western Germany. The business is characterized by increasing care, better culture, and superior skill. New varieties have been introduced, and improvements in the manufacture and treatment of wine. In Bavaria the practice of setting vineyards with poles and wires has obtained to a considerable extent.

Flax and hemp are prominent products in Silesia, Westphalia, Hanover, and the Rhine Provinces; and hemp is grown extensively in Baden and Alsace. Foreign flax-seed is chiefly used, and the home manufacture requires an import of foreign flax. Recent improvements in machinery for preparing the fiber are giving an impetus to the business. Tobacco is a profitable crop in some sections; at Pfalz a tobacco of peculiar character is grown, valuable for wrappers, to the extent of more than 60,000 acres, yielding about 11 cwt. per acre. Hops are grown largely in Bavaria, Hesse, Posen, Brunswick, and Baden. Between 1850 and 1860 the business was extended too rapidly, resulting in low prices followed by a temporary check in production, which is now increasing again. The practice of training the vines on wires has become very general.

Diligence, patient persistence, a gradual but steady march of improvement appear to characterize every department of German agriculture.

Austria.—The soil of Austria is far superior in fertility to that of Prussia, especially the valley of the Danube, a vast plain, much of it level as the prairies of Illinois, and apparently equal in productiveness to average western lands. It has been subjected to a somewhat exhaustive system of culture for a long period, and it bears with remarkable success this test of its capabilities. There is little waste land in Austria proper. With an area nearly three times that of the State of Ohio, or 75,000,000 acres, 69,000,000 are productive, or 92 per cent. of the whole. These productive lands are divided into plow-lands, which aggregate about 24,000,000 acres, nearly two-thirds of which are in Galicia and Bohemia; meadows and gardens, 7,500,000; vineyards nearly 500,000; pastures, above 13,000,000; forests, 23,000,000. Rice is grown to some extent on the coast-lands, and about 40,000 acres are set in olive and chestnut orchards in Dalmatia. In a portion of the vineyard-land, olive and fruit trees are set at regular intervals, and a double crop obtained; and in the coast provinces there are 10,000 acres in which grass and grain are grown in the intervals of the vine-rows. Fruit-trees are also planted to some extent in the pasture-lands. In the Alps there are tracts amounting to 210,000 acres which are alternately plow-lands and pasture-lands. This alternation is now disappearing. In Moravia, in 1856, there were 14,000 acres of such lands, and in 1871,

scarcely 30,000. At 2,000 feet elevation, in Styria, a system of harrow culture is in practice upon fully 500,000 acres.

Since 1861 the productive area has increased over 3 per cent. As elsewhere in Europe, the tendency to increase of farm-animals, and especially to their improvement, with reference to increase of meat, milk, and wool, is manifest. The meadows have been increased in ten years 8 per cent., and the pastures 18, while the forests have been diminished 16, and the vineyards 12 per cent. The recently reported yield of cereals is, for wheat, 15.2 bushels; rye, 14.7; barley, 17; oats, 19; maize, 15. Maize is a somewhat prominent product of this country, as well as of Hungary and Italy. In a favorable season a small export occurs, as in 1869, when nearly 5,000,000 of bushels were exported; but in 1871 the imports exceeded the exports by more than 1,000,000 bushels. The only provinces having a surplus of bread-products are Galicia and Moravia; Bohemia and Lower Austria have a small surplus in good harvests; other districts always have occasion to import, mainly from Hungary, though in recent years a small trade has sprung up with Western Europe.

The beet-sugar interest is prominent, having now 190 factories in operation, of which 126 are in Bohemia. The average price of dry beets is 4 florins and 80 kreutzers per centner, or about $2.40 for 136 pounds. The industry gives employment to 31,858 men, and 18,939 women, the wages of the former ranging from 18 to 80 cents per day, and of the latter from 13 to 75 cents.

During the exhibition in Vienna there was a permanent show of the dairy-stock of Austria made by the agricultural societies of the provinces, comprising three type specimens of each distinctive breed, if breeds they can be called, viz, the self-colored breeds, the Mariahofer, of grayish color, good keepers, the yield of milk from each of these cows ranging daily from 8 to 15¾ liters, the heaviest weighing 1,038 pounds; Lavanthaler, from Carinthia, white, small-boned, early maturing, weight 890 to 1,065, the best yielding 10¼ liters; the Stockerauer, from Lower Austria, dark gray, meat-producers, valuable for crossing with Dutch stock, weight 905 to 1,075 pounds, yielding 8 to 11 liters of milk; the Oberinthaler, from Tyrol, originating among the Alps, light gray in color, desirable as milch-cows, light of weight, small-boned, weight of exhibited specimens from 790 to 980, yielding from 7½ to 12¾ liters daily; the Murzthaler, from Styria, dark gray, good as milch-cows, and valuable for working, weighing from 892 to 1,057, the milk of the three ranging from 9¾ to 14¼ liters each; the Podolische, whitish cattle from Galicia, originating in the wild oxen of Moldavia, quick, hardy, escaping disease, useful for work, weight 1,015 to 1,072 pounds; the Opocner, from Bohemia, crosses of Swiss and natives, dark brown in color, much sought by milkmen of Prague, but nearly extinct since the war of 1866, the best giving 11½ liters of milk; and the Montafuner, light brown, from Voralberg, good tempered, 950 to 1,087 pounds in weight, giving milk 300 days per annum, yielding respectively 9¾, 11, and 12 liters daily. Besides these were several tribes of spotted or striped stock, the Kuhlander from Moravia, the Pinsgauer from Salzburg, the Molthaler from Carinthia, the Pustenthaler from Tyrol, the Zillerthaler from Tyrol, the Lichten from Upper Austria, the Egerlander from Bohemia, and the Gfohler from Lower Austria. Diplomas were awarded for the Lavanthaler, the Oberinthaler, and the Montafuner. The latter are symmetrical and handsome animals, coming very close to the English breeds in perfection of development, but scarcely equaling them in harmony of proportion.

HUNGARY.—Hungary, though a part of the Austrian Empire, prefers to be regarded as a distinct nationality. Hungary proper is about the size of Illinois, and occupies in Europe very nearly the position held by that State as a producing section. The level plains of the Danube Valley are among the very richest lands of Europe, and have long been the granary of Central Europe, to which the hungry of the German states, as the Canaanites went down to Egypt to buy bread, have made pilgrimages in search of food in seasons of scarcity.

The condition of the peasantry has been much improved. The *robot*, a labor-tax payable to the nobility, was abolished in 1848, and the wine-tax and game restrictions have been abolished. Every freeholding peasant or householder now possesses his property in fee-simple, by the same title that secures the possessions of the nobility. The land is now occupied, about one-third by small proprietors, holding from five to thirty joche, (a joch is 1.4223 acres,) or seven to thirty-five acres; a third to a medium class, owning from 30 to 200 joche; and a third to those owning from 200 to 10,000 joche. The number of holdings is 2,486,255, of which 2,348,110 are small farms. Three-fourths of the land belongs to individuals, and the remainder is held in mortmain, or by the Crown—the government lands comprising 2,700,000 joche, or six per cent. The price of land has advanced greatly during this period of political change. Formerly 50 to 60 florins per joch was a common price, now in some neighborhoods lands can be had for 100 florins; moderately productive lands in better situations command 200, and occasionally, under the competition of active demand for small tracts which are very productive, 400 florins are obtained. This is equivalent to $140 per acre.

There are two races of cattle, those of the plains, which are white, large, with long horns, herds of which form a striking picture on their broad and level pastures; and

those of the mountains, the Liebenburger, a mountain race, yellow and brown in color, small, compact, with short horns. The plains cattle are alert in movement, hardy, enduring changes of climate, and fattening readily. In Hungary proper there are 1,072 sheep to every 1,000 of the population. This is a larger proportion, in comparison with population, than is found elsewhere in Europe. The increase has been 33 per cent. since 1857. The number of sheep in 1870 was 15,077,000; of cattle, 5,279,000; of horses, 2,158,800; of swine, 4,443,300.

The great industries are flour-manufacturing, pork-packing, and grain-selling, making the country appear more like home to a western American than any other part of Europe, and the great maize-fields do not detract from the similarity; but the people, their language, their manners, their methods of industrial labor, and their agricultural machinery are all strange, and many of the comparisons instituted by the Westerner are not favorable to the progressiveness of the country. Still he will find our reapers and mowers there, and coming in yet more rapidly, while the old ladies of the harvest-field look on with sorrow, wringing their hands, with tears in their eyes, as they behold for the first time an innovation which they fear may take the bread from their own mouths.

ITALY.—In passing rapidly through Northern Italy among the most striking industrial features of the country was the vast system of irrigation in operation there, by which the clear Alpine waters are swiftly conveyed in broad and deep channels through every portion of the productive area, and distributed by a net-work of minor streams, giving refreshment, verdure, and fruitage to fields that would otherwise be dry and dreary in their comparative barrenness. There was almost a monotony in the appearance of the fields, though there was variety in unity from Trieste to Venice, from Verona to Milan and Arona, at the base of the mountains, an almost continuous field of maize, broken by parallel lines of the mulberry, which were kept closely trimmed and hung with festoons of vines. Thus three crops are grown on the same land, furnishing food, drink, and clothing. Polenta, a sort of hasty-pudding, appears to be the principal food of large numbers; it is used everywhere, sold on the markets cut in slices, taken for lunch in the field or at home, and always acceptable. Perhaps no other food could so well support so large a population.

FRANCE.—This distracted country fills an important place in the production of Europe. It is a country noted for scientific experiments in agriculture; it has 43 farm-schools under the supervision of the government, several official veterinary and other establishments for the advancement of rural industry. It makes a profiable specialty of sugar-beet production, and about 4 per cent. of its territory is devoted to the cultivation of the vine. The cereals are grown in far larger proportion to cultivated area than in Great Britain, but their yield per acre is little more than half as great, and not much greater than our own rate of yield. The practice of Great Britain is reversed: instead of two acres in restorative to one of exhaustive crops, the exhaustive area is two to one. With all this prominence given to bread-producing grains, there is a scarcity of animals and domestic fertilizers, and the result is a frequent necessity for a small import of breadstuffs. Of live stock, the horse receives the most attention, and the race of Normandy is still sought for export to foreign countries.

AGRICULTURAL TENDENCIES.

No intelligent observer, in taking even a cursory view of the agriculture of the Old World, can fail to see that the agricultural mind is active, inventive, as well as receptive; that more of energy, method, and business acumen are being infused into rural industry; that the tendencies of progress are, many of them, in the same direction in which earnest minds in this country have been pushing, perhaps more impulsively, possibly not so successfully. I will name of these tendencies a few only:

First. More liberal and general provision for fertilization. It is seen that the lands naturally the most fertile are not those on which the largest crops are actually produced, and that the fertilizing resources of earth and sea and air are sufficient to convert into a garden a desert of sand. And while commercial or chemical stimulants are found in some cases profitable, it is seen that better results at a lower cost may be secured by the production and feeding of roots and forage plants to farm-animals, and a wise economy of accessible and inexpensive local material for ultimate plant-food.

Second. More judicious and economical drafts upon stores of plant-food in the soil. Local causes may make a temporary demand and an enhanced price, and the result in the next season is an unnecessary production and an unremunerative price. This is an unnecessary waste of plant-food. A constant succession of plowed or hoed crops, especially under the exposure of a hot sun, is found to dissipate rapidly important elements of plant-growth. A proper regard for rotations, which keep the surface covered with a carpet of green at least half the time, will greatly economize such waste. Cool judgment, exact system, constant vigilance, enable the farmer to get more money and even larger production from the same expenditure of plant-material in his soil.

Third. Increase of labor-saving appliances and implements, and the substitution of

steam-power for horse-power. This tendency is marked; its results are signal. A few years ago the mower and reaper exhibited in Central Europe was looked upon in open-mouthed wonder; now it is a practical thing, beginning to be everywhere sought as a necessity. At Leeds, England, I visited the works of John Fowler & Co., where hundreds of mechanics are engaged in the fabrication of steam-plows, not only for pulverizing the soils of England and the Continent, but the valley of the Nile. There are now seven of them in use in this country. The works of the Messrs. Howard, and of Porter & Aveling, are also turning out large numbers of similar machines. Prejudice against them is breaking down; farms are being fitted to their use, fields squared, hedge-rows eradicated, ditches filled, and all other improvements following in the train of these. The best cultivation in this country must and will, in a future day, be accomplished by the aid of steam.

Fourth. Increasing intelligence and awakening emulation among farm-laborers. This is prominently seen in Great Britain; and the bonds of caste are slowly loosening in Central Europe, and medieval stolidity is gradually yielding to the mental mobility of the present age. It is now freely acknowledged in England that the demand of the farm-laborer for more wages, a better cottage, and a little allotment of land with it, is but the outgrowth of advancing civilization and education; it will be acceded to—by some cheerfully as the dictate of justice, by others without much hesitation, under the compulsion of the fear of losing their labor by emigration to America, Australia, and New Zealand. The day is past for contentment with an average of thirteen shillings per week for the labor of an able-bodied man and the support of his family. And even this is munificent compared with the wages of rural labor in some other countries. The employers are already counseling each other to meet the emergency by a higher style of cultivation, a larger use of machinery, a wiser economy of land and labor, and a more general use of steam in the various operations of agriculture.

There is one painful aspect in which the traveler views the labor of all the continental countries—the heavy, harsh, exhausting, murderous drudgery of woman. While the men appear to be playing soldier, the women seem to be the main reliance for producing the food of all, as well as cooking it, for making the clothing worn, and producing the materials of which it is made. It is bad enough to see the minor transportation of cities carried on by teams constituted by harnessing a dog to one side of a wagon-pole and placing a woman on the other, or great buckets like flattened wash-tubs borne full of water on the shoulders of women, under which they stagger with a fortitude worthy of a nobler destiny; or a bevy of barefooted females, old and young, climbing the walls of a five-story building under the burden of hods of brick and mortar. It is worse, if possible, in the free, pure air of the country, to see a woman and a bullock harnessed to a plow, a sight I am thankful not to have seen, if it exists, as is frequently reported. If that is an exaggeration, it is certainly true that in many districts a large portion of the labor of the farm is performed by woman.

Fifth. Association for improvement and for protection of property in labor on the part of those whose only property is labor, and co-operation for greater economy and higher profits by those who would employ jointly their present efforts with the accumulated surplus of past labor. Such associations are quite general in England, and their influence is extending to the continent. It is gratifying to know that some of these forms of association have been borrowed from this country, as the cheese-factories of England and the condensed-milk factories of Switzerland and Great Britain. These combinations for more effective use of small means will increase and prove salutary and profitable here as well as in Europe; but when not managed with wisdom and prudence will end, in many cases, it is feared, in mischief and failure.

I am strong in the belief that the rural population of this country will yet lead in most, as it now does in some, of the progressive movements destined to lighten the hardships of weary toil, to enhance the profits of honest labor, to render cheerful and jocund the life of the country, and to elevate the art of agriculture by all the means that applied science can furnish or business tact and wisdom can procure.

BELGIAN AGRICULTURE.

From a statement published by authority of the Belgian minister of the interior, and prefacing the catalogue of agricultural products in the Belgian section of the late Vienna Exposition, it appears that the total area of the kingdom is 2,945,506 hectares, or 7,278,640 acres, of which 2,663,753 hectares, or 6,582,400 acres, are under cultivation. The population is 5,087,105, or 448 per square mile. The soil is naturally sterile; scarce a blade of grass can be made to grow without manure; yet such is the excellence of the system of agriculture, that about one and a quarter acres per capita yield a comfortable support to the densest population in Europe, besides yielding a large surplus for export. These mag-

nificent results are secured by an unwearied struggle with natural difficulties, a constant renewal of the artificial conditions of production, and an intelligent use of the latest principles, processes, and implements of culture; steam-plows, grain-drills, horse-hoes, mowers, harvesters, thrashing-machines, and all other contrivances whereby the muscular force of man is supplemented and extended over nature, are of general if not universal use. Small cultivators of limited capital either form associations for the common ownership and working of the more expensive forms of machinery, or employ itinerant steam-plows, mowers, and thrashers, of which there is an abundant supply. The sterility of the soil is overcome by a liberal application of fertilizers. Every atom of domestic manure is saved with scrupulous care and protected from both rain and sunshine. The droppings of animals on the highways are swept up; the bones of dead carcasses are pulverized; the sewage from towns and cities and the mud from rivers and canals are elaborately utilized. Incredible sums are also invested in imported fertilizers.

FACE OF THE COUNTRY.

The small territory of Belgium presents a remarkable variety of soil and climate, necessitating a corresponding variation of treatment. The Ardennes Mountains enter the kingdom from France, crossing it a little south of Namur, presenting a considerable amount of broken surface; the maximum elevation, 2,000 feet, is found at Spa, near the city of Liege. North and northwest the surface slopes almost imperceptibly toward the sea, the minimum altitude being at Groenendyck, in East Flanders, about 5 feet above sea-level.

CLIMATE.

The climate varies with the altitude, and is remarkably free from extremes. Near the coast the clouds prevailing during the winter arrest surface radiation, and prevent a very low temperature; yet the climate is colder than on the opposite shores of England, which feel more strongly the ameliorating influences of the Gulf Stream. The aggregate rain-fall is not great, yet it is so well distributed as to give the impression of a rainy climate, while the slowness of evaporation keeps the soil moist. Eastward, these conditions change. The rain-fall remains nearly the same, but a clearer sky gives greater scope to nocturnal radiation and evaporation. This causes a greater difference between the temperatures of day and night, giving rise to more frequent and destructive frosts. Upon the southern declivity of the Ardennes range the climate again becomes milder, and a more luxuriant vegetation marks the approach to the favored countries of Central Europe.

SOIL.

The soil presents well-marked variations, giving rise to seven distinct regions or zones, the statistics of which are carefully segregated in the official returns of the kingdom. Of these, beginning at the sea-coast, the first is:

1. *The region of the Polders*, a zone eight or ten miles wide, stretching across West Flanders, the only maritime province of the kingdom. This portion of Belgium excels all the other regions in natural fertility, the soil being a compact clay of marine or partly fluviatile origin, mingled with lime from decomposed sea-shells. The alluvions which constitute this soil, varying from 2 to 6 feet in thickness, are underlaid by a bed of peat, which crops out in many places and supplies an excellent domestic combustible, the ashes of which serve as a fertilizer to

crops. The Polders, being generally below high tide, would be overflowed but for a natural dike of dunes. The area is stated at 97,304 hectares, or 240,448 acres; the population at 106,003, or 282 per square mile. This rate, being far below the average of the kingdom, is explained by the fact that the great manufacturing populations are found in the eastern provinces.

2. *The region of sands*, skirting the Polders on the south, embraces parts of East and West Flanders, Antwerp, and Limbourg. To this class of lands is also referred the narrow dike of sand, between 300 and 400 yards wide, interposed between the Polders and the sea. This region is subdivided for statistical purposes into the zone of Flanders and the zone of Campine.

The zone of Flanders presents a large plain of low altitude, scarcely averaging 160 feet above tide-water. The soil is a thin stratum of sand through which the clay subsoil frequently protrudes, greatly improving its character. This subsoil abounds in pebbles and iron oxides, which, in many places, harden into a tufa impermeable to vegetation. This soil, so little favored by nature, has been made very productive by energetic cultivation, and by the copious application of pulverized and liquid manures, night-soil, &c. This zone is characterized by a great variety of cultivation and by the frequent recurrence of "stolen" or second crops. The land is divided into a great number of individual proprietorships. The leading agricultural pursuit is grain-raising, which absorbs about a third of the total area. Rye is the favorite crop, then wheat, potatoes, grass and fodder crops, flax, &c. Those crops which are called in Belgium the "industrial crops," such as colza, camelina, poppies, hops, flax, chiccory, &c., on account of being the base of local manufactures, are cultivated concurrently with the "alimentary crops," *e. g.* cereals, beans, peas, potatoes, &c. The area of the zone of Flanders is 368,884 hectares, or 911,549 acres; the population 1,003,438, or 704 to the square mile, a density greater than that of any other region.

The zone of Campine is an immense sandy plain, rarely reaching its maximum altitude of 250 feet above tide-water. A large portion is covered with marshes, heathers, and dunes. The soil is generally a pure sand, often mingled with a varied proportion of iron oxides. The clay subsoil gives a fixity to this sand by mixture with it; it sometimes hardens into a tufa which defies even the pickax to break up. The fir is the prevailing form of vegetation, but annual plants are largely cultivated. Buckwheat and the spurry here grow almost spontaneously. Rye occupies an acreage five times greater than that of wheat, and constitutes the staple breadstuff of the country. The area of the zone of Campine is 449,752 hectares, or 1,111,382 acres; the population is 575,625, or 331 per square mile.

3. *The sandy loam region* is developed almost exclusively in Brabant, and constitutes the transition between the sandy and the loam regions. The subsoil is generally sandy, but frequently mixed with lime or clay, and is often used, like marl, for the improvement of lands. All the cereals, except buckwheat, are cultivated on a large scale. The so-called "industrial plants" here occupy a wide area. The area is 270,232 hectares, or 667,770 acres; population, 680,486, or 652 to the square mile.

4. *The loam region* extends from the Polders and sandy region southward to the French frontier, and to the Sambre and Meuse Rivers. It encircles the sandy loam region above mentioned, and the two together are frequently designated as the region of Hesbaye. The soil is con-

stituted by an argillaceous loam, sometimes called the Hesbayan loam. The subsoil is in many respects of similar composition, permeable where a calcareous mixture is found, but impermeable where the clay predominates. The agricultural character of this region is very similar to that last mentioned. Its area is 696,425 hectares, or 1,720,936 acres; its population is 1,404,499, or 523 to the square mile.

5. *The Condrusian region, or Condroz.*—The preceding regions form what may be called the base of Belgium, and are considered as a plain. Across the line of the Sambre and its extension up the Meuse lies the Condrusian region, presenting a character entirely different. It is subdivided into two zones. The first, called the *Pays de Herve*, lying between the Upper Meuse and the Vesdre Rivers, has a compact loamy soil different from that of other parts of the country. Its difficulty of cultivation has diverted farming enterprise largely into dairying and stock-raising. The butter and cheese of this region have secured a European reputation. Its area is 61,057 hectares, or 150,877 acres; the population, 164,696, or 698 per square mile.

The other zone of this region, or Condroz proper, occupies the angle of the Sambre and the Lower Meuse and a strip south of the Vesdre. The aspect of the country is one of picturesque wildness, presenting frequent geological upheavals, masses of rocks, in the clefts of which are found celebrated grottoes very attractive to tourists. The soil is thin, and varies in specific character with the underlying rocks, calcareous, schistose, &c., of the *débris* of which it is composed. At least a third of this zone is woodland or uncultivated. A black schistose soil near Huy and Liege, in the coal formation, yields a very agreeable wine, which, though not equal to French wines, is quite profitable to its producers. The teasel is grown near Verviers to a considerable extent. At Glons, Roclenge, and other localities there has grown up a considerable manufacture of "*tresses Belges*," a very beautiful fabric of fine straw for hats, which is much esteemed in foreign countries. Here also is found a considerable mining enterprise in coal, iron, lead, blende, iron pyrites, &c., besides very considerable quarries of marble, limestones, and other building-stones. The area of this zone is 487,274 hectares, or 1,204,103 acres; the population, 662,611, or 352 per square mile.

6. *The Ardennes region* skirts the Condroz its whole length, the line between them starting at Momignies on the French frontier, passing near Givet and abutting upon the Prussian frontier at Eupen near Verviers. It includes the hilly portions of Hainault, Namur, Liege, and Luxembourg. The soil is almost everywhere the visible result of the decomposition of schistose rocks, the plates of which, more or less attenuated, appear on the surface of the highways, by-paths, and hill-sides. Sometimes this decomposition gives rise to an impermeable clay retaining surface-waters in a state of stagnation. Peat-beds are quarried as a combustible, as litter for stables, and as a fertilizer. In some places the *débris* of the schist have produced a seed-bed which is amenable to cultivation. The land is treated in two ways. Near the cities, villages, and hamlets, a class of lands called "field-lands" are regularly cultivated, but the general system is called the "Celtic culture." This consists of several years of cropping intercalating with equal intervals of meadow and pasture. On the river-bottoms meadows are, in some cases, permanently maintained. The uplands are subjected, every fifteen or twenty years, to two or three successive crops of oats or rye without manure; the summits are generally avoided. The leading crops are rye and oats, with an extension of spelt and flax culture during late years. The area of the Ardennes region is 420,171 hectares, or 1,038,284

acres; population, 163,299, or 101 per square mile. This hilly region is the most thinly populated of Belgium.

7. *The Luxembourg region* occupies the angle of Belgium south of the line passing from Muno, near Sedan, to Attert, near Arlon. Leaving the bare or wooded crests of the Ardennes, the south-bound traveler finds a country of very different character from that which he has left behind—rich and fertile meadows, a milder climate, and more varied production. The soil contains copious mixtures of clay, lime, and marl; spelt is replaced by wheat, and meslin is cultivated on a larger scale than rye. Area, 91,416 hectares, or 225,898 acres; population, 67,176, or 190 per square mile.

RECAPITULATION.

Table showing the area and population of the different regions.

Regions.	Area in acres.	Population.	Population per square mile.
Region of the Polders	240,448	106,003	282
Region of the sands, zone of Flanders	911,549	1,003,438	704
zone of Campine	1,111,382	575,625	331
Sandy loam region	667,770	680,486	652
Loam region	1,720,936	1,404,499	523
Condrusian region, or Condroz, Pays de Herve	150,877	164,696	698
Condroz proper	1,204,103	662,611	352
Ardennes region	1,038,284	163,299	101
Luxembourg region	225,898	67,176	190

AGRICULTURAL PRODUCTS.

The following tables show the acreage and average yield per acre of each of the leading crops in the different regions. In addition to the acreage given below, the area in orchards is given at 119,397 acres; vineyards, 717.6 acres; fallow grounds, 131,172 acres; heather, 552,922 acres; waste-land, 95,685 acres; woodland, 1,073,931 acres. No information is given in this document in regard to fruit and vine culture or live stock.

Table showing the acreage of the several regions in leading crops.

Crops.	Region of the Polders.	Region of the sands.		Sandy loam region.	Loam region.	Condrusian region.		Ardennes region.	Luxembourg region.	Total.
		Zone of Flanders.	Zone of Campine.			Pays de Herve.	Condroz proper.			
Wheat	31,556	84,160	35,100	125,400	350,886	8,269	43,952	2,401	8,831	700,660
Spelt	.....	578	169	311	7,424	2,575	137,936	9,912	75	158,980
Meslin	.....	20,479	1,734	3,548	29,668	682	9,847	4,561	17,421	87,940
Rye	8,593	174,304	179,740	97,169	178,205	5,506	41,505	26,196	6,845	715,063
Barley	21,531	18,619	8,550	12,215	27,661	1,745	11,260	2,549	2,765	106,495
Oats	11,817	52,315	45,288	62,464	10,605	6,069	150,455	69,443	25,751	434,207
Buckwheat	1,129	9,326	23,774	4,754	2,842	82	287	143	578	42,955
Beans	16,271	4,890	1,176	6,436	25,423	660	4,611	203	280	59,950
Pease and vetchese	2,899	1,894	1,175	2,849	11,801	820	10,515	1,097	2,057	35,107
Green fodder	8,152	56,069	41,849	58,155	144,973	3,867	82,705	26,065	11,096	432,931
Hay	11,231	53,210	92,382	36,159	105,556	26,094	81,240	96,256	37,897	540,025
Root fodder crops	3,714	13,590	4,148	11,976	27,379	701	7,188	1,408	573	70,641
Potatoes	14,152	91,327	63,277	57,260	113,128	3,995	48,873	24,988	12,071	429,071
Hemp	.....	2,906	1,013	348	1,803	.....	250	600	324	7,244
Flax	4,594	59,672	11,384	11,120	47,722	.....	4,831	1,339	301	140,963
Colza	2,608	20,593	3,316	6,714	28,822	.....	1,134	2,059	303	65,549
Teasel	.....	.....	.....	.....	.....	166	129	.....	.....	295
Tobacco	.....	1,625	.....	.....	2,046	.....	.....	225	.....	3,896
Hops	.....	4,794	.....	.....	6,229	.....	270	.....	.....	11,293
Chiccory	.....	2,718	.....	.....	6,709	.....	383	.....	.....	9,810
Sugar-beets	1,377	423	677	5,732	34,871	240	2,133	5	186	45,644
Pasture	53,499	28,832	25,039	16,554	64,866	28,298	11,493	35,150	3,104	266,835

Table showing the average yield per acre of leading crops in the several regions.

	Region of the Polders.	Region of the sandy zone of—		Sandy loam region.	Loam region.	Condrusian regions.		Ardennes region.	Luxembourg region.	General average.
		Flanders.	Campine.			Pays de Herve.	Condroz proper.			
Wheat.....bush.	32.16	27.56	19.52	20.10	23.54	19.52	18.95	16.08	16.08	20.88
Spelt.....do..	.....	37.90	32.16	34.45	36.75	33.30	36.17	34.74	34.45	34.85
Meslin.....do..	.....	29.28	22.39	21.82	24.12	20.67	20.67	18.37	17.80	23.21
Rye.....do..	36.17	31.58	25.26	23.54	28.14	21.82	22.11	20.67	20.10	25.38
Barley.....do..	41.34	42.49	30.43	39.62	39.05	29.86	34.45	21.82	24.12	35.10
Oats.....do..	54.55	49.96	37.90	44.21	45.94	35.60	35.60	34.45	32.16	42.47
Buckwheat.....do..	33.88	31.58	18.37	22.74	27.56	20.67	22.97	28.71	28.71	24.87
Beans.....do..	37.90	29.86	27.56	25.84	30.43	21.82	19.52	17.23	16.65	24.52
Pease and vetches..do..	31.01	25.26	25.26	21.82	22.97	22.97	21.82	18.37	20.67	22.80
Green fodder.....tons.	1.02	10.75	7.00	8.74	9.02	6.47	9.70	4.10	4.42	8.82
Hay.....do.	1.82	2.25	1.76	1.69	1.94	2.19	1.88	1.29	1.45	1.82
Root-fodder.....do..	17.18	20.08	6.69	15.84	17.40	14.72	14.72	2.80	6.69	13.22
Potatoes.....do..	8.03	6.25	4.24	4.91	4.46	4.02	4.02	5.80	6.46	4.50
Hemp.....pounds.	.....	8.92	5.35	8.03	7.35	.....	6.25	4.46	4.91	6.48
Flax.....do..	4.68	4.91	3.13	3.36	4.24	.....	4.02	3.12	3.12	3.71
Colza.....bush.	29.86	33.59	25.26	30.43	28.71	.....	34.45	17.23	17.23	27.94
Tobacco.....pounds.	.....	16.95	.....	.....	14.81	.....	11.15	.....	.....	11.79
Hops.....do..	.....	16.51	.....	.....	14.28	.....	8.92	.....	.....	11.04
Chiccory.....tons.	.....	10.44	.....	.....	7.76	.....	5.35	.....	.....	7.04
Sugar-beets.....do..	15.61	18.30	5.80	14.72	17.40	11.38	11.38	2.68	5.36	13.72

The aggregate yield of these various crops for the whole kingdom is given as follows: Wheat, 14,657,691 bushels; spelt, 5,541,975 bushels; meslin, 2,035,442 bushels; rye, 18,123,916 bushels; barley, 3,782,943 bushels; oats, 24,111,465 bushels; buckwheat, 1,317,655 bushels; beans, 1,470,172 bushels; pease and vetches, 769,083 bushels; green fodder, 3,879,312 tons; hay, 948,515 tons; root fodder, 941,345 tons; potatoes, 1,896,649 tons, 4,669,278 pounds; flax, 52,281,156 pounds; colza, 1,823,764 bushels; tobacco, 4,934,203 pounds; hops, 10,801,647 pounds; chiccory, 82,144 tons; sugar-beets, 613,101 tons.

Of the above enumerated crops the spelt, *Triticum spelta*, is scarcely if at all known in this country. It is considerably cultivated on the continent of Europe, where it is known by the name of German wheat. It is stated in the document before us that it does not produce half as much flour as wheat. Meslin, spelled also *maslin* and *mislin*, is a mixed sowing of wheat and rye, practiced considerably in Europe.

The highest average yield of wheat, 31.16 bushels per acre, is found in the region of the Polders, the only region that produces enough of this grain to supply the home demand. The lowest average is in the Ardennes, 16.08 bushels per acre. The deficiency in this breadstuff is made up by a large foreign import. Neither spelt nor meslin are cultivated in the Polders, but both are in all the other regions. In the Condroz proper spelt occupies the largest acreage, 137,936, but the highest average, 37.90 bushels per acre, is found in the zone of Flanders. Meslin is largely raised in the loam region, occupying nearly 30,000 acres, but its highest average yield is in the zone of Flanders, 29.28 bushels per acre. Rye, the largest of the grain crops, is produced mostly in the sandy and loam regions, but its highest average yield per acre, 36.17, is in the Polders. Barley and buckwheat are subordinate and supplemental crops, the latter largely employed in what are called, significantly, stolen crops. Oats are the largest crop grown, though occupying but little over half the acreage of either the wheat or the rye crops. The largest breadth sown, 150,455 acres, was in the Condroz proper, but the largest yield per acre, 54.55 bushels, was in the Polders. Nearly half

a million acres are devoted to green-fodder and root-fodder crops—that is, crops grown to furnish food for farm animals, whether of stalks and leaves, as of corn, or of roots, as turnips, &c. The largest acreage of the former, 144,973, is found in the loam region, but the largest yield per acre, 10.75 tons, is in the zone of Flanders, which also produces the largest yield of root-fodder, 20.08 tons per acre. The "root-fodder" crops occupy but one-sixth of the acreage of the "green-fodder" crops, but the former produce one-fourth the aggregate number of tons produced by the latter. The grass-crops cover a larger acreage than the wheat or rye crops. The loam region presents the largest acreage in meadow, 105.556, but the largest average yield of hay, 2.25 tons per acre, is in the zone of Flanders. The loam region also has the largest amount of land in pasture, 64,866 acres, as well as in potatoes, 113,128 acres, but the largest average yield of the latter, 8.03 tons per acre, is found in the Polders. Beans, pease, and vetches are subordinate crops. The remaining crops, hemp, flax, colza, tobacco, hops, chiccory, and sugar-beets, receive the local designation of "industrial crops" from the fact that they are grown to meet the demand of manufacturing establishments in the country. These are of very limited acreage, but open a profitable scope for local industry.

SWISS AGRICULTURE.

PHYSICAL CHARACTERS.

In an official statement relative to Swiss agriculture, the soil of the republic is divided into three zones, the Alps, the Jura, and the Swiss plain interposed between them. The latter comprehends the southwest portion of the plateau extending from the passage of the Rhone, just below Geneva, to the defile of the Danube, near Passau. The Swiss plain lies between Lake Geneva on the southwest and Lake Constance on the northeast. The great plain of the Rhine, between the Vosges and the Black Forest, also penetrates the Swiss territory on the northwest. The Alps are divided into two mountain zones by a longitudinal depression, embracing the upper valleys of the Rhine and the Rhone and the valley of Ursern, in the canton of Uri. The mountains are evidently of igneous origin, their out-crops being of granite, sienite, diorite, serpentine, gneiss, mica-schist, porphyry, basalt, &c. The Alpine region covers 57½ per cent. of the Swiss territory. The medium altitude of this region, not considering the longitudinal and lateral valleys, is 8,325 feet above sea-level, the maximum, Mount Rose, being 15,000 feet.

The Jura range, skirting the northwestern frontier, nowhere attains the line of perpetual snow, its maximum altitude being 5,420 feet It is divided into several parallel and bifurcating chains. It shows the out-crop of only sedimentary rocks, especially the lower, middle, and upper Jurassic formations, which take their name from this locality. The physiognomy of the Jura notably contrasts with that of the Alps. Arid plains are sometimes found interposed between its ridges, but its low elevation admits of abundant vegetation. It is everywhere covered with fields, meadows, pastures, or forests. It occupies 12⅓ per cent. of the national territory.

The Swiss plain, the principal seat of the industry and commerce of the country, is a plateau rising to a medium altitude between 1,200 and 1,350 feet above the level of its great lakes. Several chains of hills and mountains traverse this plain; their summits reach an elevation of 4,000 feet. In this section are found the remarkable cities and the agricultural regions of Switzerland; it covers 30⅙ per cent. of the republic.

CLIMATE.

Local climates are subject to special influences, greatly modifying the effect of altitude. For instance, the canton of Grisons, in the southeast, is exposed to cold winds, which contracts the range of vegetation. The canton of Valais, isolated by high mountains, enjoys a genial and equable temperature. Some parts of the country are darkened by fogs. At Berne, for example, the year averages 66 days of fog—16 in spring, 30 in autumn, and 20 in winter. Great St. Bernard averages 91 days of fog per annum—26 in spring, 19 in summer, 25 in autumn, and 21 in winter. At St. Gothard the foggy days number 278 per annum—71 in spring, 79 in summer, 70 in autumn, and 58 in winter. The same variation is visible in the amount of rain-fall. At Geneva it is 31 inches per annum; at Zurich, 32; at Berne, 42; at the foot of the Alps, 42; at Great St. Bernard, 73. On the northern slope of the Alps the rainy days average 120 per annum; on the southern slope, 90 days. The government has established 84 meteorological stations, which have made valuable contributions to meteorological science.

POPULATION.

The population is given at 2,669,147, or about 166 per square mile. Of these, 1,566,347 are Protestants, 1,084,369 Roman Catholics, 18,431 Jews and other sects; 384,538 speak German, 133,575 French, 30,079 Italian, 3,826 other languages. Soil-culture employs 44.4 per cent.; manufactures, 34.5 per cent.; commerce, 5.2 per cent.; transportation, 1.8 per cent.; public administration, science, arts, &c., 3.9 per cent.; personal service, 6.3 per cent.; occupations not indicated, 3.9 per cent. The census of 1869 exhibits one birth to each 32, one death to each 40, and one marriage to each 141 of the population.

COMMERCE.

The total importations from foreign countries in 1871 amounted to 153,855,664 francs, or 57.55 francs *per capita*. Of this aggregate 63,480,295 represented cereals, being 23.78 francs *per capita;* wine, 21,467,340 francs; coffee, 20,641,940 francs; sugar, 18,082,800 francs; brandy and spirits of wine, 6,157,600 francs; butter, 6,103,130 francs; flour, 4,435,950 francs, &c. The total export amounted to 42,187,692 francs; of which over two-thirds (28,939,050 francs) represented cheese. The other items were mostly cereals, flour, butter, and coffee.

AREA AND CEREAL PRODUCTION.

The area of Switzerland is about 16,000 square miles, nearly equal to New Hampshire and Massachusetts combined. Not over 15 per cent. of the area of the republic is susceptible of cultivation. The larger proportion of this cultivable area is found in the Swiss plain, but the valleys of Jura and the Alps afford very considerable scope for agricultural enterprise. In general, landed property is minutely sub-divided, large farms being found only in Berne and Lucerne; medium properties are found in Argovie, Soleure, and Thurgovie. The cantons of Lucerne, Soleure, Fribourg, and Schaffhouse produce a surplus of grain; in Argovie and Valais production and consumption are nearly equal; in the rest of Switzerland there is a deficiency. The annual import of foreign grain amounts to nearly 4,000,000 quintals, while the export does not

exceed 60,000. It should be remembered in this connection that not less than 50,000 foreigners spend a portion of each year in Switzerland. Forests cover 19 per cent. of the Swiss territory.

FRUIT CULTURE.

Fruit culture is quite extensive in the cantons of Thurgovie, Zurich, Soleure, Zong, Lucerne, St. Gall, Appenzell, and Bâle-Ville. The fruit is either dried or made into cider, in which form it forms a considerable export, especially by way of Würtemburg. Vineyards are also scattered through Vaud, Zurich, St. Gall, Argovie, Neuchatel, Valais, Tessin, and Grisons. The annual production of wine is approximately estimated at 1,155,000 hectoliters, (30,512,559 gallons,) but the home demand requires in addition the import of 800,000 or 900,000 quintals of wine, 106,000 quintals of brandy, and 44,000 quintals of beer.

GRASS CROPS.

In meadow cultivation the leading cantons are Lucerne, Argovie, Zurich, Berne, and Soleure; then follow in order Bâle, Schaffhouse, St. Gall, Fribourg, Geneva, Grisons, and Valais. The pasture-grounds of the Alps are divided into small definite tracts called alpages. The unit of measurement of these tracts is denominated a stoss, which indicates the area of pasture necessary for the support of a cow during summer. This area varies, according to the richness of the pasture, from 2 to 10 arpents, the average being 5 arpents and 18 perches. The arpent of Geneva is equal to 1.2766 acres. A horse of three years or younger require one, two, or three stoss; three heifers will require two stoss; a calf or a hog one-fourth, and a sheep one-fifth of a stoss.

The number of these alpages is 4,559, scattered through 19 cantons and demi-cantons, and 691 communes. Individual proprietors own 2,488 of these tracts, or 54.6 per cent.; 1,525, or 33.5 per cent., belong to communes; 80, or 1.8 per cent., belong to communes and private owners together; 453, or 9 per cent., belong to corporations; 11, or 0.2 per cent., belong to the government. The altitude of these pastures varies from 2,000 to 9,000 feet; the actual pasturage of live stock in 1864 amounted to 270,389 stoss, and the actual number of days of pasturage of individual animals was 25,074,238. The value of the alpages is estimated at 77,186,103 francs. In 1864 153,320 milch-cows pastured on these alpages, returning 8,182,788 francs, beside 115,941 non-milking cows and other cattle, returning a minimum revenue of 2,703,463 francs. The total return, then, was 10,893,874, or 14.11 per cent. on the capital. After deducting a liberal margin for interest and charges of amortisation there remains a net revenue of 9,545,000 francs, or 12.4 per cent. At 5 per cent. this revenue represents a principal of 190,900,120 francs, which amounts fully to 200,000,000 by including the alpages not embraced in these statistics.

LIVE STOCK.

The aggregate value of live stock is estimated at 260,000,000 francs. The census of April 21, 1866, gave the following enumeration:

Horses.—Stallions, 428; other stallions two years old and upwards, 3,449; stallions, less than two years old, 5,647; breeding-mares, 9,515; other mares and geldings four years old and upwards, 64,380; mares

and geldings under four years, 16,905; asses and mules, 5,475; total horses, asses, and mules, 105,799.

Horned cattle.—Bulls, 10,311; milch-cows, 553,205; breeding-heifers, 74,634; beef-cattle, 52,203; calves over six months old, 172,826; calves less than six months old, 130,012; total, 993,291.

Hogs.—Boars, 1,544; sows, 30,288; fattening hogs, 190,705; sucking-pigs, 81,951; total, 304,428.

Sheep, 447,001. *Sheep*, 375,482.

The foreign trade in cattle shows an import of 103,424 horned cattle in 1871 against 6,987 in 1870; and of 2,191 calves against 2,711 the previous year. The exports of horned cattle in 1871 were 54,971 against 41,062 in 1870; of calves, 8,157 against 11,683 the previous year. In 1871 the imports of butter and lard were 55,483.49 quintals against 35,404.21 in 1870; the exports were 15,492.92 quintals in 1871, and 22,149.70 in 1870. The exports of cheese exceed the imports by about 60,000 quintals.

The dairy facilities of Switzerland are attracting the attention of foreign capitalists. Among the exhibitors at the Vienna Exposition was the Anglo-Swiss Condensed Milk Company, an association of English and Swiss capitalists, which has factories at Chane, Gossau, and Fribourg, Switzerland, and at Chippenham, England. The central office is at 38 Leadenhall street, London, but their main establishment, at Cham, in the Swiss canton of St. Gall, was erected in 1866. The company has a capital of a million of francs actually invested. In 1872 it produced 3,500,000 packages of condensed milk, each weighing one pound. It has numerous agencies in Europe.

ENTOMOLOGICAL RECORD.

By Townend Glover.

Protection against cotton-insects.—The following circular on a subject, the importance of which will be generally acknowledged, was recently sent to the regular corps of Department correspondents in the cotton-growing States:

The annual losses of cotton from ravages of cotton-insects amount possibly to half a million bales in years of insect prevalence. One-fourth of a million bales would be deemed a light infliction, and yet, at $100 per bale, such a loss would be equivalent to $25,000,000. The methods to be employed for lessening their ravages have been heretofore canvassed by the entomologist of this Department. The remedy can only be applied by the planters themselves, and their own experience can best render practicable and efficient the means employed.

Numerous correspondents have of late been experimenting with a mixture of Paris green and flour or plaster, dusted on the plants when wet with dew—a remedy which has proved very efficient against the Colorado potato-beetle and other insects. Some report this remedy effectual against the cotton caterpillar, while others declare it of no value whatever; others still hesitate to try it for fear of poisoning. It is of the utmost importance that the facts in the experience of planters the present season should be carefully reported, showing the quality and proportions of material used, the method and frequency of its application, and the observed results, that a thorough test may be made of its value or worthlessness. The answer of the following questions is therefore requested:

1. What is the result of your experience or observations as to the efficacy of Paris green, or other arsenical compounds, mixed with flour or plaster, for the destruction of the cotton-caterpillar?

2. In what proportions, and in what mode, time, and frequency of application have experiments been made?

3. Have any injurious effects of the poison been observed, either upon the plants or the soil, or in human poisoning in its application, or in the destruction of beneficial insects, as bees, &c.?

4. Have you used any other remedies, or means of extirpation, such as fires or torches in the fields, to destroy the perfect moths on their first appearance, and with what success?

Returns have been received from one hundred and seventy different counties in the cotton-growing States, Alabama and Texas being represented by the most numerous and complete statements. Of these, one hundred reported that no experiments with Paris green, or arsenical preparations, had been tried; many were from counties in which little cotton is ever grown, and others were from counties where the worms have never appeared.

1. *Efficacy of Paris green.*—Of the seventy returns reporting actual experiment a large proportion, at least four-fifths of all, declare the success, either full or partial, of the application of mixtures of Paris green or other arsenical compounds, when they are properly applied. Some are content with the simple declaration that it is an effectual remedy. Where it is most generally used it is most approved. In New Iberia, La., where a machine that will powder 15 to 18 acres per day is in use, it is said that fifty planters have found it successful. In Wilkinson, Miss., where a simple compound of Paris green and flour was used, "rows treated with the compound were healthy and vigorous, while neglected rows beside them were destroyed." In Landry, Tex., "one application of Paris green in solution resulted in ten additional bales in a field of 35 acres, over the rate of production in other fields where none was used." A similar result is reported from Montgomery, Tex., by the use of Paris green mixed with lime or plaster, or even fine sand, where "a neighbor has picked already ten bales of 500 pounds each from 13 acres, while freedmen on the same farm lost their whole crop by refusing to use it." The correspondent in Worth County, Ga., declares it "was death to everything that eats the leaves that have been sprinkled." Some correspondents enjoin the necessity of repeated applications to meet the appearance of successive broods of worms, as enough are left after the most careful application to perpetuate the noxious race. In some cases, caution is suggested not to make the application after the bolls are open, lest it become "dangerous to picker and ginner." In the cases of failure mentioned there appears no evidence that the application was properly and persistently made, and with a pure article of Paris green. In some cases where it killed both worms and plants it is very evident that the proportion of Paris green was too large or applied too heavily.

The following extracts representing different phases of the experiment will illustrate the tenor of the returns on this subject:

Craven, N. C.—Has been used in the county. Checked the worms at points where applied. Rains were frequent, labor scarce, and the experiments not continued, and the cotton was eventually damaged.

Beaufort, N. C.—Have heard of but two instances where Paris green was used to stop the ravages of the worm, and in both cases without benefit.

Calhoun, Ga.—Paris green has failed, though from 7 to 8 pounds of the green were applied to the acre every two weeks.

Jefferson, Ga.—The remedy worse than the disease. It occasioned more loss of forms and young bolls than the insect.

Macon, Ga.—Patent remedy used, but not successful. Used about 25 pounds on eight acres.

Talbot, Ga.—Experiments too limited to furnish an opinion—and mainly with arsenic in solution. It kills both plant and insect.

Duval, Fla.—Experiments with compounds, of which Paris green has been the principal ingredient, have been very successful. In every case, except where an inferior article has been used, the green has exterminated the caterpillar.

Gadsden, Fla.—No good results. Killed plants and worms.

Jefferson, Fla.—Paris green and flour destroyed and drove them away. Those parts of the plantations where applied are green and thrifty, while cotton not so treated is destroyed.

Liberty Fla.—Paris green, combined with flour or other matter, except water, is a humbug.

Blount, Ala.—Two or three applications are necessary to destroy the successive broods of worms. On light cotton the cost exceeds the profit, and on rank cotton the injury produced by forcing through it to sow the poison is a considerable item, unless more than one-fourth of the crop could be saved by the application. If worms appear in July they produce much injury; but if in September, are regarded as a benefit.

Greene, Ala.—Kills the worm when it eats the poison. If applied on their first appearance will prove of benefit. The poison was only applied once, and killed many worms, but did not seem to stay their ravages.

Marengo, Ala.—Used it on a large scale. Paris green will certainly kill the caterpillar, if pure and properly applied, either in solution with water or in combination with flour, which must be sound.

Wilkinson, Miss.—Paris green and arsenious acid used, with some failures from improper application and impure drugs. I am convinced of the efficacy of pure Paris green and flour alone. Rows treated with the compound were fresh, vigorous, and healthy, while neglected rows were destroyed.

Noxubee, Miss.—It is much trouble to scatter the compound. Thus far no good has been accomplished.

Avoyelles, La.—Paris green was used to a limited extent in this parish, and when properly mixed and applied was a triumphant success.

Claiborne, La.—Used patent remedies and killed worms and plants. Made it weak, and killed neither worm nor plant.

Austin, Tex.—Numerous experiments made with patent remedies—effectual in destroying the worm, but retarded the growth of the cotton. An unpatented combination, increasing the amount of flour, destroyed the worms without injury to the plant. The application must be made before the bolls open, and in no case after, as if dropped on the cotton it becomes dangerous to picker and ginner.

Fayette, Tex.—Quite a number of experiments, and all of them with good results, both with dry preparations and arsenical solutions. The effect does not appear at once, but is seen in from twenty-four to forty-eight hours. There has been much prejudice, but all will fall in next year; and, with a favorable season, we expect to take a bale of cotton from an acre. Cotton is cleaner where the green is used. Arsenical solution the cheapest mode.

Fort Bend, Tex.—Experiments varied and extensive, chiefly with Paris green and flour, 1 pound of Paris green to 20 or 40 pounds of flour, one to thirty being best proportion. Satisfactory; expense being about $5 per acre.

Freestone, Tex.—Mixing the green with flour or other powders has not succeeded so well as the solution, and cannot be administered so cheaply or thoroughly.

Montgomery, Tex.—Paris green mixed, either with flour, lime, plaster, or very fine sand even, applied in the morning, from daylight until an hour after sunrise, while the dew was on the plant, has been universally efficacious. Arsenic in solution has also been used, but with little effect. It burned the leaf and caused the squares to fall.

2. *Proportions and mode of application.*—The mode and time of application, both of arsenical mixtures and solutions, are indicated by a selection of representative extracts, as follows:*

Jones, N. C.—One to twenty-five. Sifted from a tin vessel having a perforated bottom, and attached to a staff 10 feet long. One or two applications sufficient. Cost, $1.50 per acre.

Craven, N. C.—One to twenty-five. Shaken on to the plants from a box with a long handle when the dew was on the plants. One pound of arsenic to eight gallons of water was equally effectual. One pound of Paris green to ten pounds flour destroyed the leaves.

Richland, S. C.—One to twenty parts of flour.

Jefferson, Ga.—One to twenty-five. Killed the forms and young leaves.

Jefferson, Fla.—One to twenty-five. Should be applied at night when the wind is down and the dew is on the leaves. It must be repeated after a shower, or it will be rendered useless.

*Where no other substances are mentioned, Paris green and flour by weight are understood.

Duval, Fla.—Royall's patent used. One to twenty-eight answers equally as well and is less expensive; costing, with labor and materials, from $1.30 to $1.40 per acre.

Putnam, Fla.—Sifted upon the plant, the operator being mounted and the animal muzzled.

Butler, Ala.—Apply in August when worms first appear—two applications will suffice—1¼ pounds to 8 pounds flour, 50 gallons water; or 1¼ pounds green, 1 pound resin and gum arabic each, with 20 pounds of flour.

Clark, Ala.—Used in proportion of 1 to 28 with the desired effect. Applied 6th of August, and ten days later, (the heavy rains washed it off,) by means of a bucket with sieve bottom. Have also used a spoonful of the poison in a bucket of water, shaken on by means of a shuck tied to a stick.

Grenshaw, Ala.—One to twenty-five, flour or lime; 1 to 40 gallons of water.

Greene, Ala.—One-quarter pound green to 30 gallons water. One hand rides down the rows on a mule and sprinkles from a watering-pot.

Hale, Ala.—One-half pound to 40 gallons water.

Marengo, Ala.—One pound in 20 used, dusted on by means of sieve when the plant is wet with dew or rain. At the same time used 1 pound in 40 gallons of water, (to an acre,) applied with fine watering-pots, when too dry for the powder to stick. Two applications will, doubtless, save the crop. The green is not soluble, but by keeping the water stirred, better results are obtained.

Montgomery, Ala.—Has been mixed in proportion of 1 pound of green to 20, 25, and 30 pounds of flour. Applied on the first appearance of the worms by means of a tin strainer.

Perry, Ala.—One pound in 40 gallons water to an acre.

Clark, Miss.—One to thirty, sifted on when worms first make their appearance in the morning, repeating in ten to fifteen days.

Wilkinson, Miss.—Treated with 1 to 30 by weight, sour flour, carefully mixed, per acre, and by means of a mosquito-netting bag on a pole, held over the plant and slightly tapped. This is done in the morning while the dew is on. The sun evaporates the moisture and the poison is glued to the leaf.

New Iberia, La.—Paris green and flour, and arsenic and lime, have each been used with equal success. They have also been used with a sprinkler. A sifter is used.

Rapides, La.—Best results from solution of arsenic in the proportion of three-quarters of a pound to 40 gallons (barrel) of water—1 barrel to 3 acres—used by means of a watering-pot.

Saint Landry, La.—One pound to a barrel of water.

Austin, Tex.—Proportion, 1 to 26, adding a little resin and gum arabic; applied with a sieve attached to a forked stick, which is tapped as the operator moves along the row. Dust while the dew is on, walking to windward.

Comal, Tex.—Paris green 1 to 20 by weight—also used with water, 1 ounce arsenic to 1 pound water. Remedies most effectual when used in the morning.

Fort Bend, Tex.—No regular systems for application. Some have used sieves, others coarse netting sacks, while dew was on, some using through the day and for the third time. Arsenic dissolved in water also used with good effect.

Freestone, Tex.—Paris green succeeds best in solution, and is administered more thoroughly and cheaply; 2 ounces to 1 pound of green to 10 gallons water, administered with a common watering-pot.

Lavaca, Tex.—Royall's patent, 1 pound green to 1 pound resin, one-half pound gum arabic, and 17 pounds flour. Two applications saved the crop when worms first appeared, and on the appearance of second crop.

Leon, Tex.—One-fourth to one-half pound arsenic in water to an acre. Sprinkled with common sprinkler.

Sabine, Tex.—One-half pound green, 10 pounds flour, 10 pounds lime, and 1 pound resin to an acre. Put three-fourths of this amount on at intervals of four weeks when the worms first appear would be the best mode.

3. *Injuries or poisonous effects.*—Nearly all returns made reference to the matter of poisoning or injury from the application, and most of them stated positively that no injurious effects were observed. Several assert that when too liberally applied, or in too strong a solution, the leaves are spotted or killed. In Rapides Parish, La., "in some cases plants were injured and nearly killed by the Royall's mixture," and in Claiborne Parish "a patent remedy killed plants." In Avoyelles, La., "caused blooms to shed to a limited extent." In Sabine, Tex., our correspondent's stock roamed at large over the field with no injurious results. "Reports of horses and mules dying from licking the poison from the stalks" are returned from Brooks, Ga. Our correspondent in Worth, Ga., says: "Stock has been poisoned by eating the cotton, and it

has made several persons using it giddy when advantage was not taken of the wind. Turkeys and chickens have been killed from eating the dead worms." It is deemed a decided advantage in Putnam, Ga., that it kills the noxious weed known as beggar's lice. There are reports from Crenshaw, Ala., of "a few cases of injury to human beings and to stock and some destruction of birds eating dead worms," but no particulars are given; and a similar report from Carroll, "one or two cows killed from eating the cotton." One correspondent expresses the opinion that it will prevent the pasturing of cotton-fields after the picking is over. The Craven (N. C.) correspondent says: "No inconvenience from poisoning where the right proportions are used. The caterpillar or flock bird feed upon these worms in the same fields where the poison is strewn, and grow very fat. Sportsmen kill these birds and thousands eat them, yet have not heard of any one being injured."

4. *Means of destruction.*—Most of the returns fail to indicate the use of any other than arsenical compounds for the destruction of cotton-insects. Several declare definitely that no others have been tried. Of those which are reported the following extracts will give an idea:

Jones, N. C.—Fires or torches are of no service. Carbolic soap has been tried and believed to be good. It is used in the proportion of one gallon of soap to ten of water.

Beaufort, N. C.—Ravages stopped in one field by a flock of turkeys.

Granville, N. C.—Turkeys saved the crop.

Worth, Ga.—Ceasing to cultivate cotton for a year or two, and resting the lands, is the remedy.

Sumter, Ga.—Fires and lamps are worthless.

Jackson, Fla.—Tin lanterns of peculiar construction, also torches, have been used with success.

Gadsden, Fla.—Turkeys highly recommended. Kerosene-oil and turpentine in small quantities in water have been used with some good effect.

Orange, Fla.—Birds are encouraged, and we find it pays.

Butler, Ala.—Torches and fires, with little or no success.

Carroll, Ala.—Fires used with no effect.

Jones, Miss.—Fires will retard the progress of the caterpillar.

Noxubee, Miss.—Fires and torches in some instances seem to have done good. The best remedy is early and clean cultivation.

Madison, Miss.—Fires and lamps used with only partial success.

Clark, Miss.—Fires, torches, and small lamps used with only partial success. Would be more useful if practiced by every planter in a neighborhood, as it attracts the moths from neighboring farms.

Warren, Miss.—Early in July last sheet-iron pans, 18 by 15 inches by 2 inches deep, containing coal-tar to the depth of ¼ inch—and about 4 inches above the center of each pan of tar a lantern was secured—were placed on stakes something higher than the cotton-plant, set about 100 feet apart in the field, and light being placed in the lanterns at night many millers or moths were destroyed, but without perceptible relief. Earlier commencement and a more general effort in a similar direction may accomplish something in future. No poisons were tried.

Bossier, La.—Running a sweep-plow through the rows does more good than anything else. It rakes the worms off the cotton and covers them up.

Comal, Tex.—Large lamps set in pans of molasses used extensively through the county. One lamp to one hundred yards square, lighted at early dusk. Moths were collected with very favorable results.

Lavaca, Tex.—Night lights have been used. Unless universally adopted by all farmers not much benefit derived, as the light attracts from adjacent fields. Fields where lights were used have been known to be first destroyed.

CONCLUSIONS.—From the answers to the various questions above quoted, the following is a summary of the conclusions:

The use of Paris green, when pure and unadulterated, mixed with flour in the proportion of 1 part of Paris green to 25 to 30 parts of flour, is of utility, and in many cases has saved the crops; that in many instances where the Paris green has failed it has been attributed to improper use or using a spurious article. Paris green or arsenic, also used with water and sprinkled over the plants, has been used with good effect,

but to be of any avail the water must be well mixed up and stirred at the time of using it, as the Paris green or arsenic is only partially soluble in water, and requires to be thoroughly disseminated throughout the water, to be deposited as a slight coating of poisonous powder on the leaves to be of any avail. When Paris green or arsenical compounds are used great care must be taken not to make the mixture too strong, or they will kill or injure the leaves and plants. When used as a powder dusted over the plants, the plants must be wet in order to make the powder adhere to the leaves. Rains will wash the mixture away from the leaves, and it will have to be renewed after heavy showers. Some glutinous or sticky substance may be used with the Paris green and flour in order to cause it to adhere to the leaves, but it is not necessary. Sour or spoiled flour will answer as well as the best; plaster, ashes, and even dust have, in some cases, been substituted for the flour, but has not answered the purpose as well as flour. Applying the Paris green on the first appearance of the caterpillars is recommended, and as soon as possible after the second crop of worms appear on the plants also. No notice has been taken of patent insect-destroyers, as the patentees claim a private and exclusive right to use them. Only a very few cases of injury to man or beast have been observed, and even some of those cases are not well substantiated by proof. It, however, would be well to caution persons using this poison to be on the windward side when dusting or showering it on the plants, and not to let stock in to feed upon the foliage. The prejudice of the negroes against using Paris green is now partially removed. The application of Paris green not strong enough to injure the cotton will kill the beggar's-lice weed in the rows. One or two of the favorable accounts of the success of Paris green in certain localities must be considered, however, as occurring in the same neighborhoods where the worms mysteriously disappeared in neighboring fields *without* the aid of the poison. Fires are said by some planters to be of use in attracting and destroying the moth or miller, and by others to be injurious, as attracting moths from neighboring plantations; and it has been observed that the cotton has been very much attacked immediately around such fires afterward, as if the moths had been attracted by the fire and deposited their eggs in the vicinity. Torches are of no avail unless generally used by all the planters in a neighborhood, except when placed over pans or dishes containing some adhesive substance, and into which they fall. Great complaints have been made by planters about the indiscriminate destruction of insectivorous birds, which ought to be protected by law, as they are exceedingly useful in destroying the cotton-caterpillar. Some planters used salt-water in the proportion of a gill to a bucketful, and thought they experienced beneficial results from its use, while others plowed between the rows with pine brush fastened to the swingle-tree in order to sweep off the caterpillars from the plants onto the ground, where they are either buried under the earth or scorched to death before they are able to reascend the plants. Kerosene-oil, cresylic soap, and other preparations have been used, but to no great extent, though with some beneficial results. Turkeys driven into the field, as in the case of the tobacco-worms in Maryland and Virginia, will quickly exterminate many of the caterpillars, and have been highly spoken of by three of our correspondents.

In many cases the correspondents consider that when the cotton is attacked quite late in the season, and after the last bolls are formed, the caterpillars are rather a benefit than injurious, as by eating off the dense foliage, the air and sunlight being admitted, the bolls that would otherwise not ripen and open are fully matured.

THE PHYLLOXERA.—The following article from the Bulletin des Sceances de la Societe d'Agriculture de France, 1872, p. 514, may be of interest to some of our vine-growers as showing the good effect of an application of soot for the destruction of the grape-vine root gall-louse. However, not having tried the soot ourselves, we can only give the experience of others, and add that Dr. Erni, formerly chemist to the Department of Agriculture, in a letter from Berne, Switzerland, has also highly recommended the use of soot for the same insect.

M. Rogier, mayor of Poule Gard, exhibited to the central society of agriculture the results obtained by the use of soot in the treatment of vines attacked by the *phylloxera*. A young vine attacked by this insect in 1869 was treated with soot put at the foot or root of each stem in the quantity of a half kilogram, (about one and one-tenth of a pound.) The vine recovered. The following years all the stems which composed it were smoked with soot. This vine has a remarkable vigor, while the neighboring vines were dead or seriously injured. All vines treated with soot, used as a preservative compost, are healthier, although surrounded with diseased vines.

We give the above extract for what it is worth, and hope some of our correspondents will try soot and report the result to the Department, as we have scarcely any of these destructive insects in our own immediate neighborhood. In reference to this insect, the grape-root gall-louse, the Department has received a very interesting letter from Mr. George W. Campbell, of Delaware, Ohio, in which he expresses his opinion that the aphis (*pemphigus*) affecting the leaves and that upon the roots are not identical. He says:

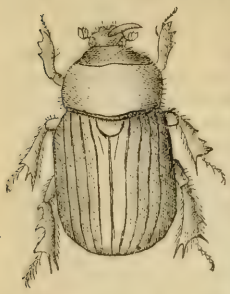
I have since then found in two instances what were doubtless eggs of the *phylloxera* (root-gall-louse) upon diseased roots the same as those within the galls, but solitary, and not in clusters as in the galls. This, I think, settles the question, that the aphides infesting the roots are propagated under ground, upon the roots, and that they are probably not the same as are propagated in the galls upon the leaves.

Mr. Campbell also sent specimens of the roots injured, together with numerous root gall-lice clustered upon them, but although carefully examined with the microscope we failed to find any eggs whatever upon the roots sent. These roots, however, have been planted just as received with the insects upon them in a flower-pot and placed in a large wardian case in close contact with other pots containing healthy vines, in order to find out if the insects will pass from one vine to another during the winter, and if the healthy roots will next season be infested with either root or leaf gall-lice. We give Mr. Campbell's remarks merely to stimulate further inquiry into the identity of the two insects, as many naturalists have stated them to be merely varieties of the same insect. In France it appears that flooding the vineyards at certain seasons to drown the insect out has been recommended, but this plan even if successful could only be carried out in level places, and could not be adopted in side-hill vineyards.

THE COLORADO POTATO BEETLE.—In reference to this insect, *Doryphora 10-lineata*, our correspondent in Dodge County, Nebraska, sends the following:

As soon as the soft bugs or grubs are hatched in the early part of the spring, I harrow the patch with a slanting (backwards) tooth harrow; the beams knock off the grubs and the teeth bury them in the soil, from which they have not power to rise. When the plants are over 6 inches high I use a two-horse four-shovel corn-cultivator having hung sticks of round fire-wood, 3 feet long, by ropes transversely across the frame about a foot and a half in advance of the shovel-blade; the dangling sticks knock off the grubs, and the shovels effectually bury them. I do this in the middle of a hot, dry day, and have kept two acres completely clean by going through once a week, thus keeping down the bugs and the weeds at the same operation. Two to three hours' work of this kind will accomplish more than a dozen children in a whole day with sticks and pans, according to the old way.

XYLORYCTES SATYRUS.—A very large black beetle with a short horn on the top or front of its head has been very injurious to young ash-trees in the neighborhood of Babylon, Long Island, where it has appeared in great numbers according to a letter from a correspondent, Mr. P. H. Foster, who states that after expending five days' labor in digging out the beetles his foreman estimated the number destroyed at one bushel, while Mr. Foster himself thought there were at least twenty-four quarts. He says:



We found as many as fourteen at the root of one tree 8 feet high, and have looked over about 6,000 trees, mostly white-ash, and a few European, (*F. excelsior*,) and out of this number 1,500 had holes around them; these we opened and obtained the above results. I did not discover their depredations until they had destroyed a number of my young trees. Another season I shall study them more thoroughly.

The insect alluded to is known to entomologists by the name of *Xyloryctes* (wood-borer) *satyrus*, of Burmeister, and is not very uncommon in this neighborhood, where it has been taken at the roots of ash-trees. The larva resembles the white grub of the corn-field, which is the larva of the May-bug, *Lachnosterna*, but is of a much larger size, and has a black head instead of the head being of a red color as in the common white grub. These larvæ feed on the roots of ash-trees, and have been taken also on liquid amber, a sweet gum, in Maryland.

The best way to destroy them is, in spring and autumn to dig up around the roots of ash-trees infested and to destroy white grubs, of any size whatsoever, found in such situations, as it is in the grub state they injure the roots. The perfect beetles should also be dug out at the time they make their appearance as perfect insects and destroyed before they have had time to lay their eggs for another brood the following season.

INSECT INJURIES.—*Cotton-caterpillars* (from description probably *Anomis xylinæ*) appeared for the first time in Sussex County, Virginia, stripping the foliage of the cotton-plant. The same insects, with the *boll-worms* (*Heliothis armigera*) were more or less destructive in Chowan, Pitt, Tyrrell, Beaufort, Rowan, Currituck, and Pamlico, North Carolina; in Lexington, Marion, and Marlborough, South Carolina; in Putnam, Stewart, Floyd, Taylor, Muscogee, and Marion, Georgia; in Taylor and Wakulla, Florida; in Chambers, Choctaw, Clinch, Worth, Talladega, and Dallas, Alabama; in Lee, Jasper, Grenada, and Wilkinson, Mississippi; in Tensas, Claiborne, and West Feliciana Parishes, Louisiana; in Brazoria, Blanco, and Cherokee, Texas; in Garland, Arkansas, and in Shelby, Tennessee.

Various preparations of Paris green and other poisons have been used in different portions of the cotton-growing region. In some localities farmers were deterred from using them by fear of casualties to man and beast. In Cherokee County, Texas, false reports were rife of actual injuries, but these soon exploded. Ginners were also afraid to gin poisoned cotton, lest the product of vegetation might contain sufficient poison to be injurious.

Grasshoppers, (*Caloptenus femur-rubrun*, &c.,) were reported in Carroll County, New Hampshire, as lively till the last of October. In Palo Pinto County, Texas, grasshoppers appeared September 20, and left October 2, destroying all verdure, not even excepting fruit-tree foliage. Tobacco and corn crops were injured by them in Medina, Lorain, and Geauga Counties, Ohio. In Orange County, Indiana, they were destructive

upon all fall crops till they were killed by the severe freeze of October 28. In Redwood County, Minnesota, they were particularly damaging to potatoes, beans, and buckwheat. In Sioux, Harrison, Monona, and Plymouth Counties, Iowa, they injured all the crops. In Clay County, Missouri, and in Smith County, Kansas, they were also mischievous. In Madison County, Nebraska, the prospects of a fine crop this year were greatly depressed by these pests; they were also heard from in Antelope and Nemaha Counties; they were rife in the western part of the State. In San Luis Obispo County, California, they injured potatoes. They were troublesome in Clay County, Dakota, in Lewis and Clarke County, Montana, and in Bonhomme County, Dakota.

Potato-insects.—Our correspondents would confer a favor by designating the particular kind of insects depredating upon potatoes. Many of them speak simply of potato-bugs, but it appears sufficiently evident that in most, if not in all, cases the Colorado beetle (*Doryphora decemlineata*) is meant. Injuries are reported in Garland County, Arkansas; in Marion, Brooke, and Tyler, West Virginia; in Anderson and Livingston, Kentucky; in Washington, Franklin, Medina, Lorain, Crawford, Geauga, Hamilton, and Mercer, Ohio; in Calhoun, Oceana, and Livingston, Michigan; in Martin, La Porte, and Ohio, Indiana; in Tazewell, Mason, and Boone, Illinois; in Calumet, Saint Croix, and Washington, Wisconsin; in Kandiyohi and Steele, Minnesota; in Fayette and Audubon Counties, Iowa; in Pettis and Maries, Missouri; and in Clay, Dakota. An insect formerly destructive of potatoes (*Cantharis marginata*) attacked spinach and other garden vegetables in Elk County, Pennsylvania. Paris green is used with increasing effectiveness in abating these nuisances.

Insects designated by the unmeaning term corn-worms (probably *Heliothis armigera*) were mischievous in Waldo, Maine, and in Bandera and San Saba, Texas. Grub-worms (*Lachnosterna* sp.) injured the corn in Bland, Virginia, and in Washington, Wisconsin. The weevil (*Sitophilus oryzæ*) infested the corn-crop of Wilkinson Mississippi.

Chinch-bugs (*Micropus* (*Rhyparochromus*) *leucopterus*) are reported as shortening the corn-crops of Gibson, Dearborn, and Ohio, Indiana; ana; in Pike and Boone, Illinois; in Jasper, Gasconade, Miller, Douglas, Texas, Perry, Phelps, Maries, and Dallas, Missouri; in Labette, Montgomery, Woodson, Wilson, Neosho, and Cherokee, Kansas. Our correspondent in Labette, states that the fourth brood of these insects were destroyed by frost, and inquires whether this will not arrest their reproduction the coming year. The eggs of the chinch-bug have been found by the entomologist in the ground in midwinter awaiting only the warmth of coming spring to hatch them out.

Cabbage-worms (*Pieris* sp.) are reported in Wyoming, New York, and in Franklin, Ohio.

Tobacco-worms (probably *Macrosila Carolina*) did some damage in Dickson, Tennessee; in Nicholas, Kentucky; in Franklin, Missouri.

Fruit-insects, undesignated, were observed in Marion and Whitfield Georgia. The apple-crop was affected by core-worms (*Carpocapsa pomonella*) in Harrison, West Virginia. A great variety of insects, names not given, were destructive to crops in Grundy and Montgomery, Tennessee. In the last report notice was taken of the absence of birds from the forests in this State. The correspondence of the Department shows that the pernicious practice of shooting birds has gained ground in the South in the last few years. The great increase of insect depredators may be partly traced to this cause.

CHEMICAL MEMORANDA.

By William McMurtrie, Chemist.

Bat-excrement.—During the early part of the month of October this Department received from Messrs. Miller & Tancré, of Huntsville, Alabama, a sample of organic material, which was accompanied with the following communication:

> We send you to-day, by express, a small box containing specimen of a deposit found in a cave on the plantation of Mr. B. F. Watkins, in Lauderdale County, Alabama, on the Tennessee River, about forty miles west of Huntsville. The cave has never been thoroughly explored, but is thought to be about two miles in length, with rooms opening on either side of the main entrance. It is inhabited by a countless number of bats, from whose discharges the deposit in question is formed. No correct idea can be formed with regard to the extent of this deposit, but in many places it is found to be fifteen feet deep.
>
> By request of Mr. Watkins we send you this specimen for analysis, as he wishes to ascertain its value as a fertilizer, and the proper ingredients with which to compost it for either cotton or cereals. There is in it also a lump of niter, which also exists in a large quantity. This was worked during the war by the confederacy in the manufacture of saltpeter.

The color of the deposit is dark brown. The material is very light, and seems to consist of small scales, which are probably the remains of insects. This fact, together with the fact that the cave from which it is obtained is inhabited by a large number of bats, may be considered fair evidence in support of the theory advanced with regard to its origin.

The lump accompanying the dark sample, supposed by our correspondent to be niter, cannot be considered as such since it contains no potassa or other alkali of any account, and but a small proportion of nitric acid. On account of the presence of this latter constituent, as well as of the soluble phosphoric acid, it has some agricultural value, and will be found useful in admixture with the other material. When taken from the box it was quite moist, and when cut through, the section presented a white and yellowish mottled appearance. On exposure it dried, forming a tolerably hard mass, which crumbled upon application of slight pressure, and when crushed it was very fine and pulverulent. From the results of analysis given below it seems to be an accumulation of siliceous clay.

The analysis resulted as follows:

Moisture	12.800
Organic matter	9.700
Silica, insoluble in chlorhydric acid	42.290
Silica, soluble in chlorhydric acid	9.410
Phosphoric acid, soluble in water	0.2277
Phosphoric acid, insoluble in water	1.4673
Peroxide of iron	0.1159
Alumina	19.88
Lime	1.6377
Magnesia	2.09
Nitric acid	0.0823
Sulphuric acid	Trace.
Soda	Trace.
Carbonic acid	Trace.
	99.7019

The dark-brown material has a greater agricultural value, since it contains a much larger quantity of the constituents which are imme-

diately available for plant-food. It may be used with advantage in the raw state, in favorable quantities, without composting, for either cotton or cereals; but in cases where it may be more convenient for application it may be used with any kind of composting materials whatever.

The analysis of this material gave the following results:

Moisture	11.60
Insoluble silica	30.81
Soluble silica	3.18
Insoluble organic matter { containing 3.72 per cent. of nitro- {	28.687
Soluble organic matter { gen = 4.52 per cent. of ammonia {	10.573
Free ammonia	Trace.
Phosphoric acid, soluble in water	1.305
Phosphoric acid, insoluble in water	1.5016
Peroxide of iron	1.428
Alumina	3.21
Lime	4.11
Magnesia	3.11
Soda	0.312
Nitric acid	0.122
	99.9486

DITAINE, NEW SUBSTITUTE FOR QUININE.—The use of *Eucalyptus globulus* as a substitute for quinine has been quite thoroughly discussed, and now we find another plant which bids fair to make equally as great a stir in the medical world. The plant in question, *Echisers scolaria*, belongs to the family of the Apocynaceæ, and grows quite abundantly near Luzon, in the province of Bataugar, in the Philippine Islands. Its bark has for some time been employed by the inhabitants of the province as a cure for all kinds of fevers. M. Gruppe extracted from the bark the active principle, which he called *ditaine*, and which has been used in the hospitals in the same manner and the same doses as quinine. It is said to be quite as efficacious as quinine without producing any of its disagreeable effects, and has been found very valuable as a tonic.

DIGESTIBILITY OF PHOSPHORIC ACID AND LIME BY ANIMALS.—In the course of some investigations with feeding lambs by Dr. V. Hofmeister, at the royal veterinary school at Dresden, he found that when known quantities of phosphoric acid and lime were administered to lambs and wethers, variable quantities of these substances were digested. He first experimented upon two separate lots of lambs, one lot being fed upon hay and potatoes alone, and another lot fed upon an equal quantity of hay and potatoes, to which was added a known quantity of precipitated phosphate of lime. This course of experiments extended over several months, when it was found that the amount of phosphate of lime digested varied with the amount administered, the phosphoric acid of the former decreasing as the latter was increased. Thus when the lambs were daily fed with 6 grams of the precipitated phosphate of lime, a maximum quantity was digested, but when 9 grams were administered only about one-half of the phosphoric acid was digested. On the other hand, in the latter case the amount of lime digested increased to 86.2 per cent. against 65.6 per cent. under the former conditions.

So also with feeding two-year-old wethers with superphosphate of lime, or the phosphate of lime soluble in water, it was found that when 10 grams of this material, containing 1.95 grams of phosphoric acid and 1.20 grams of lime soluble in water, and 2.036 grams phosphoric acid and 3.90 grams lime insoluble in water, the whole of the soluble portion, together with 4.24 per cent. of the phosphoric acid and 23.7 per cent. of the lime of the insoluble portion, was digested. But when 20 grams of the superphosphate were daily administered,

only 64.7 per cent. were digested. Dr. Hofmeister, therefore, concludes that when small quantities of the phosphate of lime are added to hay and potatoes, about one-half of the phosphoric acid and about 42 per cent. of the lime is digested. But when a larger quantity is administered, the digestibility decreases about 20 per cent., only about 30 per cent. being then taken up; while the amount of lime which is digested is increased to 65 per cent. against 23 per cent. taken up in the previous case. What would be the influence of a continuation of this treatment upon the subsequent health of the animals has not been determined.

MANGANESE IN BEECH-LEAVES.—J. A. Wanklyn has observed in the course of some investigations upon the value of different leaves for use as tea, that beech-leaves yield 20.8 per cent. of extract, which, upon incineration, yields 2.44 parts of ash, the latter containing so much manganese as to cause it, in the dry state, to show a decided green color, and upon treatment with water to give the characteristic red solution of permanganate. Mr. Wanklyn suggests that on account of the great fragrance of the extract it might possibly be used as a beverage.

EFFECT OF STREET-GAS UPON VEGETATION.—By a series of experiments upon the effect of gas upon different species of trees by Messrs. Späth and Meyer in the botanical gardens in Berlin, it has been found that when the gas is brought into contact with the roots of trees for considerable length of time, in quantities however small, though some trees are able to withstand this influence longer than others, yet all must finally succumb, and will at last sicken and die. The influence is much less active during the winter, when the rootlets have become woody, than during the period of growth in the summer, when they are young and tender, and are therefore in a better condition to absorb the gas.

FREEZING WINES.—A very important industry bids fair to arise in the way of improving the quality and richness of wines and other alcoholic fluids by submitting them to very low temperature. It has been found that alcoholic liquids containing 50 per cent. of absolute alcohol become viscous at −30° C., (= −22° F.) When taken from a wooden vessel, (to avoid contact with cold metal or glass,) rum and cognac thus cooled to −40° to −50° C. (= −40° to −58° F.) have the curious property of producing but a slight sensation of cold upon different organs. If cooled to −71° C. (= −96° F.) they are said to produce an effect similar to soup which is a little too hot, but when placed upon the skin they slowly cauterize without burning. Sparkling wines subjected to this treatment increase about 60 cc. per bottle, while non-sparkling wines increase only about 15 cc. One-half to two-thirds of ordinary wines may be removed by freezing, leaving a liquid which may be dirty at first, but becomes clear by standing. They become richer in alcohol and extractive matters; their aroma as well as their color is improved, and they lose by coagulation and precipitation all the albuminoids and salts, which form an abundant magma. M. Melsens, who has worked up the matter, states that the ice which separates, if submitted to centrifugal force or pressure, is entirely free from alcohol, and that 40 per cent. of ice may be removed from Bourgogne wines.

With well-organized work and suitable apparatus this method may be successfully applied to the amelioration of wines, and may in some cases even take the place of distillation. Since freezing preserves and enriches the wines, and heating protects them from maladies, it is probable that a combination of these two methods of treatment will remove the difficulties of bad years.

NITRIFICATION OF SOILS.—M. Schloesing, who has devoted a great

deal of attention to a consideration of the value of nitrogen and nitrates in agriculture, has lately published the results of some very interesting investigations with regard to the formation of nitric acid in soils under different conditions. He finds that the slow combustion of organic matter in the soil is, in many cases, almost independent of the amount of oxygen in the confined air, but that it varies considerably according to the temperature. Thus, at an average temperature of 24° C. (75° F.,) more carbonic acid was formed than at an average of 16° C., (60°.8 F.,) that formed in the latter case being not more than one-half the quantity produced in the former.

The amount of oxygen in the confined air had but a slight effect in the formation of nitric acid, but it was found that the formation varied with different amounts of moisture in the soils, and that it was much more variable in dry than in very moist soils. For example, in the case of nearly dry soil the production of nitric acid varied from 95.7 to 246.6 milligrams per kilogram of earth; while in the case of earth which had absorbed a maximum amount of moisture, (24 per cent.,) the production varied from 199 to 225 milligrams of nitric acid per kilogram of earth.

In his experiments upon the reduction of nitrates in the soil, M. Schloesing's results indicate that not one-fifth the amount of ammonia was formed which should have been produced from the nitrogen of the nitrates present, and he concludes, from the facts observed, that there is always a loss of nitrogen in the decomposition of organic matter, whatever may be the cause.

RESPIRATION BY SUBMERGED AQUATIC VEGETATION.—In experiments with regard to this subject by Schutzenberger and Quinquaud, upon yeast and *Elodea canadensis*, they found that the former showed no other phenomenon than that of absorption of oxygen with production of carbonic acid. The extent of this absorption is not affected by light, but varies considerably according to the temperature at which it takes place. At 10° C. (50° F.) it is almost inappreciable; it increases until a temperature of 50° C. (122° F.) is reached, but at the temperature of 60° C. it is entirely stopped.

Light seems to have no effect in the respiration of *Elodea canadensis*, the absorption being the same in the light as in the dark, but it differs from yeast in that during the diurnal respiration it gives off free oxygen. If a large quantity of the plant be immersed in a tolerably small quantity of water, and submitted to direct sunlight for an hour or two, numerous bubbles of gas will be liberated, and a supersaturated liquid will be obtained which may contain as much as 20 cubic centimeters of oxygen per liter. The manner of absorption is the same for both plants, but in case of the *Elodea* the absorption is about ten times less.

EUCALYPTUS GLOBULUS, *its use in improving the salubrity of marshy and malarial districts.*—The many very interesting accounts which have been published with regard to the *Eucalyptus globulus* do not seem to have exposed all of its values. And we find in *Comptes Rendus* of Oct. 6 a note presented to the French Academy of Sciences by M. Gimbert, in which he describes another value equally as great as those with which all are so familiar. From reports received from various reliable sources, it seems to have been determined that in localities where the *Eucalyptus* flourishes there has been a complete disappearance of intermittent fevers. "A tree," says the author, "springing up with incredible rapidity, capable of absorbing from the soil ten times its weight of water in twenty-four hours, and giving to the atmosphere antiseptic

camphorated emanations, should play a very important part in improving the health of malarious districts." It has the property of absorbing directly and rapidly the water of shallow marshes, thus preventing the fermentations which are produced, and paralyzing the animal miasma proceeding from them which might arise from them. The predictions with this regard, which were made in 1869, have in all cases been realized. The author furnishes a few of the numerous results, which are very interesting.

The English were the first to experiment in their sanitary plantations in Cape Colony, where they were eminently successful. Two or three years were found sufficient to change the climatic conditions, and the aspect of the malarious districts of their possessions.

Some years ago the Algerians took occasion to spread the *Eucalyptus* throughout the French possessions in Africa, and the following are some of the results obtained, as communicated by M. Trottier:

"About 20 miles from Alger, at Pondouk," he says, "I owned a property situated near the river Hamyze, the emanations from which produced intermittent fever among the farmers and their servants every year. In the spring of 1867 I planted upon this farm 13,000 plants of the *Eucalyptus globulus*. In July of that year, the season in which the fevers appear, the farmers were completely free from them. In the mean time the trees had scarcely attained a height of more than 8 or 10 feet. Since that time the settled population has been entirely free from fevers."

Fourteen thousand *Eucalyptus* trees were planted upon the farm of Ben Machydlin, in the vicinity of Constantine. It has for several years past been noted for its insalubrity, being surrounded with marshes throughout the entire year. The trouble entirely disappeared and the soil became perfectly dry in five years. The atmosphere is constantly charged with aromatic vapors, the farmers are no longer troubled with disease, and their children are bright with health and vigor.

The operations of the manufactory of Gué in Constantine were rendered wholly impracticable during the summer on account of the pestilential emanations from the marshes with which it was surrounded. M. Saulier conceived and put into practice the idea of planting a large number of *Eucalyptus* trees in these marshes, and in three years about twelve and a half acres of the marshy soil were converted into a magnificent park. The water completely disappeared, and the health of the workmen has since been in good condition.

In consequence of the large grove of *Eucalyptus globulus* on the farm of Maison-Carrée, which is situated in a district in which the inhabitants formerly succumbed to the malaria, similar hygienic revolutions have taken place.

It is stated by land-owners in Cuba that there also the paludal and telluric diseases have disappeared from the malarial districts where the *Eucalyptus* has been cultivated.

According to Ramel, Australia is very healthy where the *Eucalyptus* flourishes, and unhealthy where the tree is not found.

On the banks of the Var, near the entrance of a railroad-bridge, is situated a garrison-house, near which earth-works were thrown up to dam the river in order to build the bridge. The malaria arising from it made it necessary to change the guard each year. Two years ago M. Villard, the engineer in charge of that section of the road, planted 40 trees in the vicinity of the building, and since that time this post has been the most healthy in the country.

These evidences fully establish the fact that the *Eucalyptus globulus*

has a good effect in preventing the spread of malarial diseases, and that it may serve decidedly practical purposes in this particular. Throughout our entire South and Southwest many valuable enterprises have been wholly impracticable from causes stated above, and if the examples thus set before us were followed throughout the South, there is no doubt that many of the dismal, swampy, and marshy districts, hitherto entirely worthless, may be transformed into beautiful, pleasant, and healthy sections.

BOTANICAL NOTES.

By George Vasey, Botanist.

Bromus Schraderi, or Australian Oats.—Mr. C. W. Stewart, of Montgomery County, Texas, sends to the Department a very interesting report of trials by him of various kinds of grasses. He enumerates Australian oats, or *Bromus schraderi*, and ordinary Fescue grass, evidently under the impression that they are distinct grasses. Of the latter he says:

> The ordinary Fescue grass which I find, (as Dr. Lincecum, of Washington County, Texas, long since mentioned to be a native plant, growing wild near the Navasota River,) is an annual. Of this I was able to sow 2 bushels. After being "set," say the second year, it can be grazed from 1st February until seeding time, when it resets itself fully, thus relieving one of the care and labor of replanting. It is a most valuable winter grass.

There is evidently a great deal of confusion about this grass, or these grasses. In the Monthly Report for July it was stated that the *Bromus schraderi*, Kunth., was the *Bromus unioloides*, Willd.; and that, although it has been called Australian grass, was not an Australian but an American grass. It has had several synonyms, among them that of *Ceratachloa australis*, Spreng.; the specific name *australis* meaning southern, and referring to its locality in the Southern States, and not in Australia. By a confusion in this respect it probably came to be called Australian grass or Australian oats. The name "Fescue grass" properly belongs to some species of *Festuca*, which is very nearly related to *Bromus*.

In the Patent-Office Report for 1853, page 212, is published a statement from General Iverson, of Columbus, Ga., concerning a grass which he was cultivating, and which he calls *Ceratochloa breviaristata*. This name was applied by Hooker to a grass collected by Douglass in Oregon, which has since been described as *Bromus breviaristatus* by Mr. Watson in the "Botany" of Clarence King's "Exploration," who states that it is common in the meadows of Nevada, and probably extends from Washington Territory to New Mexico. This suggests the thought that perhaps even *Bromus breviaristatus* may be identical with *Bromus schraderi*, alias *Bromus unioloides*, but further investigation is necessary.

Aquilegia chrysantha.—In the grounds of the Department during the past summer one very attractive object was a clump of *Aquilegia chrysantha*, Gray, raised from seed brought by Dr. Palmer from Arizona. The plants grow about 4 feet high, branch freely, and when in flower present a mass of golden-yellow blossoms, which it is a pleasure to look upon. It is very similiar in form to the sky-blue aquilegia (*A. cærulea*) of the Rocky Mountains, but besides the contrast in color it blooms more freely and continues to furnish a succession of flowers during July and August. The species was discovered more than twenty years ago

by Mr. Geo. Thurber, (of the American Agriculturist,) and was called *A. leptocera* by Dr. Gray. Recent observation of the plant in a growing state convinced Dr. Gray that it was a new species, and he has accordingly redescribed it under the name given above.

The American Agriculturist for September gives a figure of the flower with an account of its history. It is perfectly hardy, and is well worthy of cultivation. Indeed, it has already made a good start in that direction among English florists. The Gardener's Chronicle (London) for October contains a flattering notice of it, with some details of its history and nomenclature. Whoever possesses this species, with the sky-blue aquilegia, (*A. cærulea*,) and the native scarlet one, *A. canadensis*, will have the choicest of the aquilegias.

PURPLE CONE-FLOWER, (*Echinacea purpurea.*)—A specimen of this plant in cultivation from Illinois presented some features which commend it to attention for the garden. Although somewhat coarse in foliage, its large flower-heads terminating the naked peduncles are quite showy from the dark-purple, almost black, conical center and the numerous (10 to 15) light-purple pendant rays. These rays are about 2 inches long by ¼ inch wide. The plant is vigorous and hardy, and is worthy of trial in the flower-garden.

FERTILIZATION OF FLOWERS.—This subject has received much attention of late, and our knowledge has been much extended by the researches of various observers. A recent article by Mr. A. W. Bennett, in the Popular Science Review, gives an interesting résumé of recent observations, from which we gather the following items:

Every person who has carefully examined the subject is aware that a great portion of flowers are cross-fertilized, that is, the female organs are fertilized by the action of pollen, not from the same flower, but from other flowers of the same kind in the vicinity, and that the most common agencies in producing this effect are, the wind and insects.

A very good and familiar example of flowers fertilized by the agency of the wind is furnished by the common hazel, (this refers to the English hazel, but will apply equally well to our American species,) which flowers from January till the early part of March, even when the weather is very cold and when there are scarcely any insects on the wing. The flowers of the hazel are of two kinds, male and female. The male flowers constitute the familiar catkins which drop off and disappear before the leaves make their appearance.

The catkins are generally in bunches of from two to four, every catkin containing, on an average, perhaps from one hundred to one hundred and twenty flowers. Each of these male flowers consists of a simple scale-like tract, inclosing from eight to twelve anthers, each of which discharges, when ripe, a cloud of innumerable pollen-grains: so that the number of these grains in any single catkin must be prodigious. The female flowers are found on the same branches as the catkins, and are also in clusters of from two to six, (the future nuts,) and are of equally simple structure with the male flowers, being formed of single pistils, appearing like slender crimson threads protruding from scaly buds. If one of these crimson threads is placed under an ordinary pocket-lens, it will generally be found to have on its surface several apparently minute particles of dust, which, on further examination, are found to be pollen-grains which have been blown from the male flowers. Each individual pollen-grain has the power of emitting a pollen-tube which penetrates the stigma, reaches the ovary, and by the fertilization of the ovule induces the formation of the embryo, and thus the development of the ovule into the fertile nut. Since the only means by which the pollen can be conveyed from the male to the female flower is the agency of the wind, and it is only quite by chance that any of the grains can reach their destination, the reason is obvious of the enormous amount of pollen with which the catkins of the hazel are furnished. In some plants, whose fertilization is effected in the same manner, the quantity of pollen is still greater, and this is especially the case in the *coniferæ*, or fir-tribe. American travelers have described how the water of some of their lakes near the shore is covered at certain seasons by a thick stratum of a sulphur-like substance, the pollen blown from the neighboring pine woods. Whether the female flowers of the hazel are fertilized from the catkins on the same or on a different bush is a point still in dispute.

There is little doubt that the wind exerts a great influence upon the fertilization of some of our cereal crops, though botanists are not unanimous on this point. It would appear from recent researches on this subject (see Monthly Report for May and June) that some of the grains are subject to close-fertilization, and others to cross-fertilization, in either case the occurrence of violent storms of wind or rain at the season of flowering might operate injuriously upon the fertilization, and thus justify the anxiety which farmers are said to possess as to the occurrence of favorable weather at this season.

In the majority of flowers, however, the structure of the pollen, or the arrangement relative to one another of the pistil and stamens, is such that fertilization could not be effected by the wind alone. Sometimes the pollen-grains themselves are too large and heavy to be thus conveyed, or they are united together by fine threads or even in dense masses; or the position of the stigmatic portion of the pistil is evidently not adapted for the pollen to reach it in this way, and nature then employs as the agent in fertilization insects or other small animals. This opportunity is afforded by the visits of insects to the flowers in search of the honey, or nectar, which forms an important portion of the food of many classes. The mode of attraction to the flowers which serve them as food is mainly two-fold, scent and color.

Nature is always economical of her resources, and accordingly we do not generally find that strong scent and brilliant variegation of color are bestowed on the same flower. Those which are most prized for the power or delicacy of their scent, have, as a rule, flowers either inconspicuous or, if large and conspicuous, of uniform unvariegated color; as, for instance, the mignonette, primrose, sweet violet, lily of the valley, honeysuckle, linden, and many others, while the most brilliantly variegated flowers are comparatively or quite scentless, as the fritillary, *Pelargonium*, *Tropæolum*, *Mimulus*, *Ranunculus*, pansy, &c.

One of the largest of scented flowers, the evening primrose, blossoming only in the night, is fertilized by night-flying moths, which probably require the large sulphur-yellow flowers, as well as the scent, to guide them from a distance in the dim light. American naturalists state that many of the largest and most gorgeous flowers of the western continent, such as the *Bignonias*, or trumpet-flowers, are fertilized by humming-birds. Another mode in which insects assist in the fertilization of flowers is by the voluntary deportation of pollen; and this is chiefly effected by *Hymenoptera* belonging to the class *Aphidæ*, which includes the hive and humble-bees that build nests in which they store up large quantities of food for their young while in the larva state. This bee-bread, as it is termed, with which the thighs of homeward-bound bees are seen to be heavily laden, consists almost entirely of innumerable pollen-grains robbed from the flowers, which the little depredators may be seen to despoil in a very scientific manner. Though the greater quantity of this pollen is carried home, small quantities of it are unavoidably left behind here and there on the stigmas of the flowers, quite sufficient to ensure the fertilization of the ovules.

We mentioned at the outset that though the large majority of flowers are cross-fertilized, yet there are exceptions to the rule. There are not a few flowers which never or scarcely ever completely open their petals so as to allow either the entrance of an insect or the escape of the pollen.

In many plants belonging to widely separated natural orders, either intermixed with the ordinary conspicuous flowers, or appearing at a different time of the year, there are peculiarly-shaped flowers, called *cleistogamous*, which are self-fertilized. Among the natural orders in which these flowers have been found are *Violaceæ*, *Cistaceæ*, *Oxalidaceæ*, *Balsamineæ*, *Polygalaceæ*, *Caryophyllaceæ*, *Leguminosæ*, *Campanulaceæ*, *Convolvulaceæ*, *Acanthaceæ*, *Labiatæ*, and *Commelynaceæ*. The two species of *Impatiens* or Touch-me-not, which grow wild in this country, *Impatiens Noli-me-tangere*, and *I. parviflora*, as well as a North American species, *I. fulva*, which is fully naturalized in some places, have closed, imperfect, self-fertilized flowers intermixed with the showy yellow ones.

The most easily observed instances are, however, in the case of our common wild violets, the sweet violet, (*Viola odorata*,) or the various forms of the dog violet, (*Viola canina*.) The existence of these flowers in Viola was known as long ago as the time of Linnæus, who states that the flowers of *Viola mirabilis* produced in the spring are often barren, while the later ones, which have no corolla, are fertile. The *cleistogamous* flowers of the violet appear long after those that are familiar in the spring, and may be found in abundance in July and August, very small, but still not difficult to make out. These closed summer flowers produce an abundance of seed. In accordance with the ordinary practice of economy by nature, the amount of pollen in the *cleistogamous* flowers is generally very much less than in the open ones, since it has very little chance of being wasted.

More detailed examination of these closed flowers in different plants will doubtless yield interesting and important results.

MICROSCOPIC OBSERVATIONS.

By Thomas Taylor.

During the last two years the Department has received numerous letters from orange-growers in Florida calling its attention to a new form of disease that has appeared on their orange-trees. The branches become covered, more or less, with a rust-like substance which ultimately destroys the affected parts.

Mr. J. H. Gates, of Pilatka, Fla., under date of November 27, 1872, writes to the Commissioner of Agriculture as follows:

Inclosed are a few orange-leaves, and also an orange having a dark skin, which was the case with nearly half of the crop of some of our growers last season. They are not so much discolored this season. The coloring matter, whatever it may be, does not injure the quality of the fruit, but it affects its market-value. Also, please find inclosed three branches of an orange-tree having a rusty appearance, and in some places blistered. I have trees which have lost all their tops, apparently from this cause. Any information relative to the cause or cure of this disease will be gladly received by myself and neighbors.

In a second communication from the same writer, dated December 31, 1872, further information is given in relation to the so-called rust of orange-trees. He says:

It first appeared in this section (Saint John's River, near Pilatka) about three years ago. The young buds were first attacked. The disease next spread to the young wood, and then gradually over the tree. We observe that the disease is more general on the low-lands, and it generally appears on transplanted stumps having buds from one to three years of age. I have not known any bearing-trees to have rust on their bark. Some persons in this vicinity think that the rust is caused by a worm; others by cocci; while others suppose that the black coloring-matter on the skin of the orange is silica. Any light thrown on this subject by the scientific men of your Department will prove of great value to us.

The following letter received by the Department from Mr. F. L. Darcy will not only prove of interest to orange-cultivators, but also to those who desire to investigate this disease. The writer first refers to insect-disease as being its probable cause, then to the dark stains on oranges, and lastly to the rust, so called, on the branches.

Buena Vista, Orange Mills Post-Office, Fla.,
January 5, 1873.

Sir: In reference to the disease of the orange-trees I have to say that I have noticed it for many years, more or less, in every orange-grove that I have visited, but never in such quantity as to be at all alarming. In my own groves I have not for twenty years observed more than three or four trees affected by it. Those were budded trees—sweet buds on the wild or sour orange stock. These trees were inclosed in a small fowl-yard about 20 feet square, boarded up 5 feet high, with a small house inclosed. The trees outside of the inclosure within 20 feet of the former grew well, and having been set out and budded at the same time of the first, were all planted in 1836, and have continued perfectly healthy. After three years' trial I found that the four trees within the inclosure were still unhealthy. Every season they threw out young, vigorous branches which grew till they were 6 to 8 inches long, when they would commence dying back from the extreme ends, and the bark in most instances would become rough and of a yellowish hue, while the trees from year to year remained about the same size. I concluded to remove the fence and house from around them. This was done three years ago. The trees, with one exception, are now as vigorous growers and as healthy as their neighbors, while the fourth is gradually improving. This disease, I think, is produced principally by an insect. The bark of the tree is punctured and the eggs deposited there. In the case of the four trees mentioned I am of opinion that they first became diseased from being too closely confined and not having free circulation of air during the heat of summer; the great stimulating quality of the fowl-house manure

may also have had a bad effect on them; for soon after removing the inclosure and manure they commenced gradually to improve, and are now nearly restored.

A very common error of beginners in orange-culture consists in burying the tree too deeply in the ground, covering up from 4 to 8 inches of the collar of the stock, which should be above ground. In this condition the tree may live, but will grow very slowly, making very little new wood for years. When the buried collar has thrown out artificial roots the trees may revive, and in the mean time will continue to throw out vigorous sprouts, but they will die back each season, much to the disappointment of the impatient cultivator. This is termed "damping off." When this is the case it is easily remedied by lifting the tree, or by bringing the natural roots to the surface. Drainage is all-important for orange-trees. They will not flourish when the roots remain in stagnant water.

The disease known as the rust has affected the orange-trees since 1864 in this section of the State, the consideration of which is of far more importance than the black substance, &c., on the trees alluded to. The "rust" may be caused by an insect or a fungus.

I will send you some samples of the oranges having dark stains, and also a few having clear skins, taken from the same tree, hoping that some of your scientists may be able to inform me what are the causes of the respective diseases, and, if possible, to suggest to me a remedy.

Respectfully, your obedient servant,

F. L. DARCY.

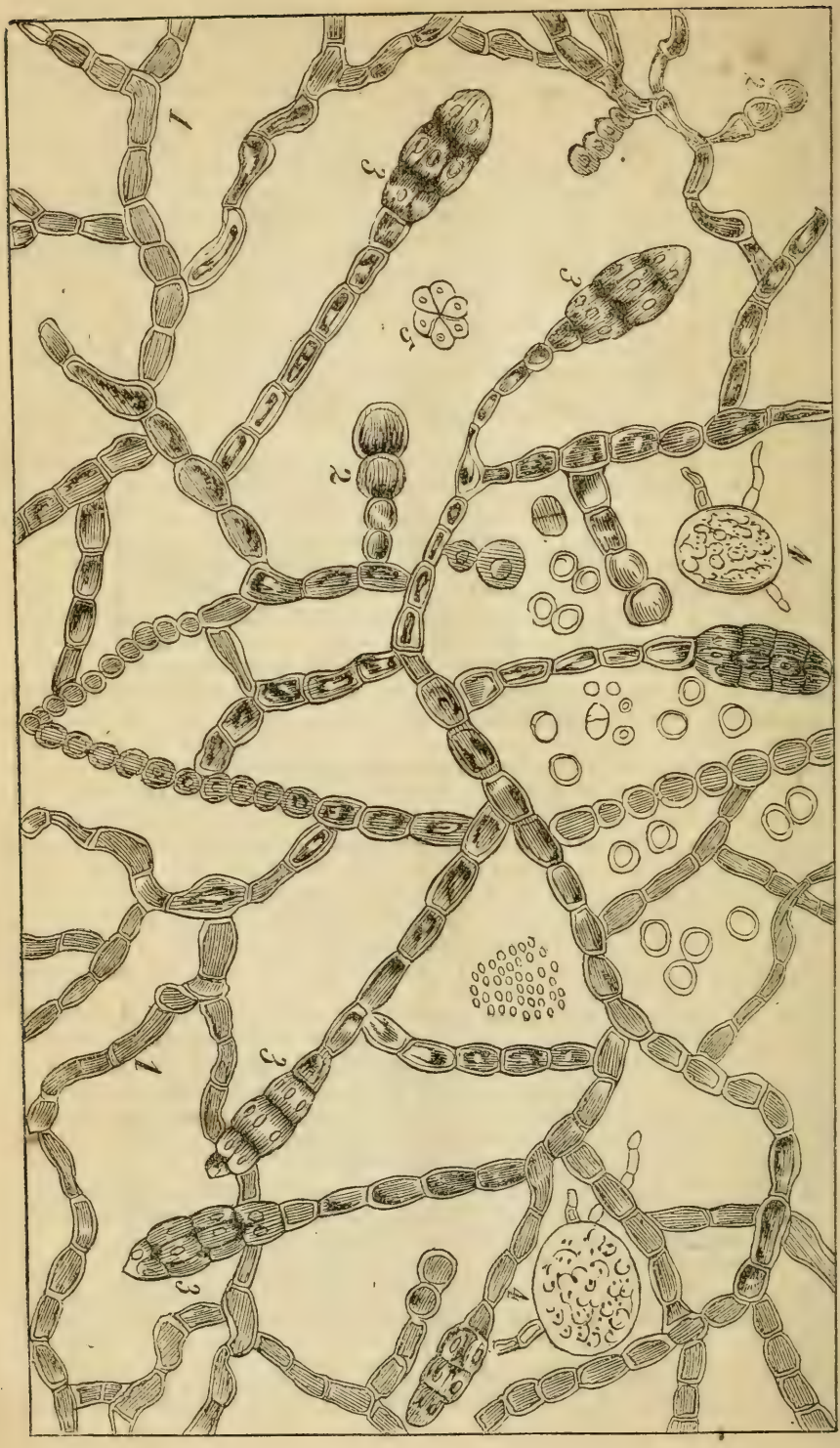
Mr. J. A. Whitner, of Mellonville, Fla., states that "the rust appears either on high or low lands, more frequently on the low or flat lands, which in this locality are imperfectly drained. The trees affected with this disease are always checked in growth, but rarely die. They recover under high cultivation with judicious manuring, but bear small and imperfect fruit, with a tough, spotted rind, and a hard, insipid pulp. I send you, as requested, by this mail, specimens of twigs affected by this fungus, healthy and unhealthy, taken from the same tree; also specimens injured by bark-lice. These insects are very destructive and widely spread in this vicinity. They are the cause of the fungi or leaf smut generally confined to young trees."

The Department has received several communications from orange-tree cultivators of Texas in relation to orange blight, but thus far it would seem that the rust blight is unknown to them, as the following from Mr. Sidney Scudder, mayor of Galveston, Texas, will show:

Your communication of November 27, 1872, was duly received. Careful inquiry of orange-tree growers and personal examinations of numbers of trees in this county have developed nothing in the shape of disease among them at this time. The excessive drought of the past summer diminished the crop considerably and caused the fruit to become unusually sour and unpalatable. This was, however, effectually remedied by loosening the earth under the trees and spreading ashes or pulverized soil, or charcoal around them. The Rev. P. C. Tucker was particularly successful with this remedy applied to his orange-trees this fall.

On being supplied with specimens of the so-called "rust," blackened leaves, branches, and fruit, I made a series of observations and experiments to ascertain, if possible, the character of the various phases of the fungus and affected parts, of the plant, so as to be able to point out cause and effect. I removed portions of the rust from the branches, subjected them to a power of about 30 diameters, and viewed them by reflected light. No fungoid forms were visible.

I next treated a portion of the rust with caustic potash, in which the so-called rust proved partially soluble. The insoluble portions were washed with pure water until all soluble substances were removed. I then subjected several portions of the insoluble parts to a power of about 100 diameters, when they were seen to consist of cellular, fibrous, and woody matters, and were wholly free from fungoid forms. I next subjected a portion of the "rust" to the action of alcohol of 95 per cent. proof. The alcohol became tinged of a brown color. On pouring a portion of the liquid into water a white precipitate was formed, showing the presence of a resin.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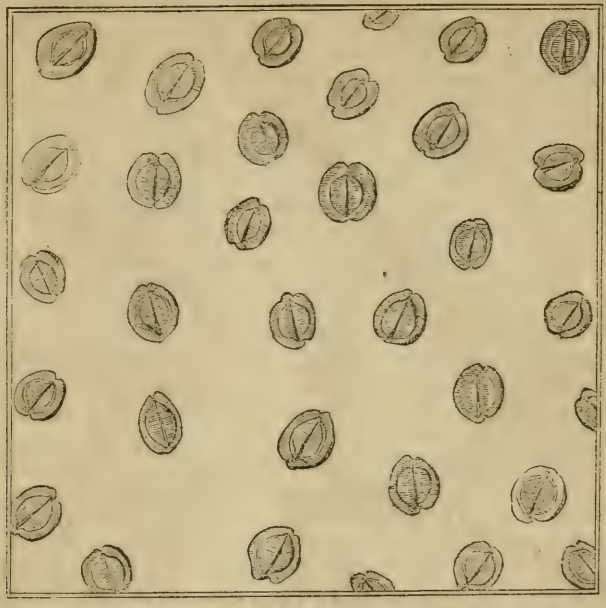
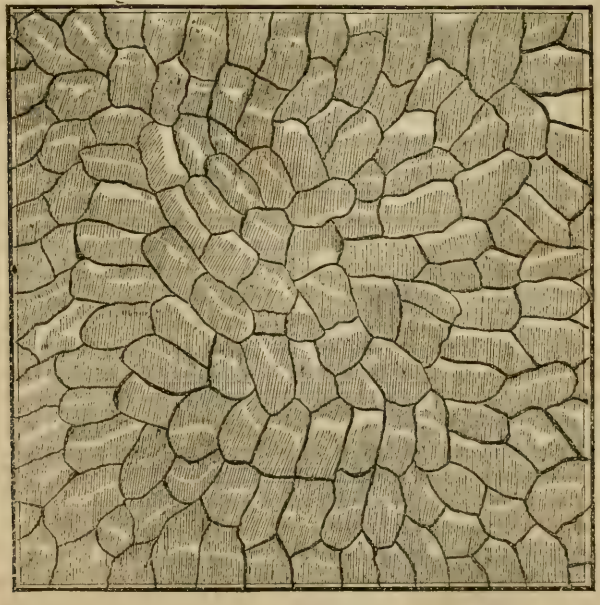
A very close inspection of the "rust" under a power of about 5 diameters exhibited, in some cases, a slight gloss on the surface. At this stage I became convinced that the "rust" was probably only an effect



of a fungus, and consequently not the cause of the dying back of the branches. On the development of these facts, I suggested that Mr.



Gates should make a thorough search for specimens of "rust" exhibiting a slight translucency. In due time specimens were received from him

slightly translucent, portions of which were held over the flame of a spirit-lamp, when instant resinous ignition took place. Its smoke had the odor of burning shellac. The "rust," so called, proved to be composed of albuminous and resinous matter combined with vegetable cellular tissue, earthy matter, &c., unimportant to consider in this case. My attention was next directed to the investigation of the black matter on the leaves, branches, and fruit. I removed a portion of the black matter from a leaf. It appeared as if composed of black, granular matter, cemented with flour-paste, and formed into thin sheets of the thickness of tissue-paper. When dried it may be cut to any form desired. Sometimes it appears as a fine black powder scattered over the leaf, and is frequently found in quantity at the base of orange-buds. On placing a portion of the black matter under a power of about 100 diameters, it is seen to consist of a branched and jointed mycelium or spawn of a fungus. After making many observations, under a power of about 600 diameters, the fungus, in its various stages, was clearly defined. I, Fig. 1, represents its mycelium growth; 2 2 its budding cells, which terminate in fruit-cells; see 3, 3, 3, 3, bearing spores which germinate; 4 4 are fungoid aggregations which throw out filaments; their relation to the black mycelium is not represented thus far; 5 represents what appears to be a cross-section of the asci or fruit, when perfectly formed and cut through its greatest diameter crosswise. The surface of the leaf is generally covered with these germinating-spores when the black mycelium is on the leaf; being colorless they are invisible. Frequently Vandyke colored cells are seen on the leaf. They consist of disjointed mycelium. To the naked eye the fungoid spores, &c., appear black, but under the microscope they appear of a Vandyke brown, with the exceptions noted. It is known to mycologists as black mycelium. Berkley says that of late years the black mildews have raged to such an extent in the Azores and Ceylon as to threaten the complete annihilation of the orange and coffee plantations, and the ravages have been scarcely less among the olives in some parts of Europe. It is impossible that light can have its proper effect through such a medium on the tissues of the leaves. It would be as rational to expect that plants would thrive under a brown bell-glass as that vegetation should not be impaired when the greater part of the plant is covered with a thick, dark felt. The mildews are often accompanied or preceded by a coccus, and I believe that the first stage of growth of most *Antennariæ* is more frequently observed where the leaves have been soiled with honey-dew.*

It has long been observed that a black powdery substance always forms on the leaves, buds, and the fruit of the orange-tree and some other plants when attacked by the "mealy-bug" and orange-scale insects. The plants are doubtless punctured by these pests, causing a flow of sap from the ruptured parts, which probably forms a nidus for the black mycelium to vegetate in, spreading over the whole tree, blackening and destroying it. The skin or epidermis has its peculiar functions to perform, and, if covered, its healthy action will be impeded. All molds and blights are plants of a very low organization, and live in this predacious way; but many are flowering herbs, and even shrubs. One of the latter is the mistletoe, the seed of which germinates on the boughs of the tree where it falls, or is left by birds, and forming roots, which penetrate the bark, the plant ingrafts itself into the wood, to which it

* Honey-dew is a sweet, saccharine substance found on the leaves of trees and other plants in small drops like dew. Two substances have been called by this name, one secreted from the plants, and the other deposited by a small insect.

becomes united as firmly as a natural branch to its parent stem. Indeed, the parisite lives just as if it were a branch of the tree on which it grows and feeds.

Botanists represent that the green bark of plants is furnished with breathing pores as well as the under surface of the leaves, and in some cases the upper surface. In this case I determined to ascertain their relative number on the green bark and leaves of the orange-plant. With this object in view a portion of the bark was removed with a sharp knife, and treated with hot caustic potash, after which the epidermis was easily removed. When mounted and viewed with a power of about 100 diameters the numerous pores were seen and could be counted. A portion of the skin no larger than a fly-spot contained about twelve of these breathing pores. I next experimented with the orange-leaf to ascertain the true character of its upper and under surfaces. A leaf was placed in a strong solution of nitro-muriatic acid, which bleached it slightly and rendered it somewhat transparent by oxidation, without softening the albuminoids which bind the surfaces together. The next step was to wash the leaf in water to free it from acids. With a circular steel punch a portion of the leaf was cut out and placed for a few minutes in a capsule containing a strong solution of chlorinated soda, after which it was placed in pure water when the epidermis of the under surface of the leaf floated off. I floated the disc thus removed on to a microscopic slide, using a camel-hair brush to assist in the manipulation, and mounted it with gum and disc in the usual way. The surface was found to be almost destitute of cellular structure. The stomates are best seen under a power of about 600 diameters. (See Fig. 2.) The green bark and under-surface of the leaves contain about 64,000 of these pores to the square inch of surface. The thick disc should be floated on to glass as above, and its superfluous moisture removed with clean blotting-paper. Its exposed surface should be placed face downward. With a point the epidermis may be removed, which place in water and float on to a glass slide as before described. It will represent the upper surface of the leaf. On examination with the microscope it exhibits cellular structure only and seems to be wholly destitute of stomates. (See Fig. 3.) The fleshy portion on the third slide should have a drop of thick gum placed on it and be covered with a glass disc. When viewed under a high power it becomes an object of much interest. The branching vascular bundles will be distinctly seen, resembling in some respects the arteries and veins of the human body. A careful examination will show that these are also covered with a very fine lace-work of cells under and over them, and interspersed among the latter will be seen a vast assemblage of translucent dottings, each having an opening across it corresponding to those of the stomates under which they were situated before dissection. The structure of the leaf taken as a whole indicates the great necessity of cleanliness and high culture; for the more complicated the organic structure of the plant is, the greater will be the number of its economic products, and the more apt are abortions in the form of fruit to be produced in the case of neglected culture or unfavorable climatic conditions. In plants there are "milk-vessels, turpentine, oil-receptacles, and the like, which form canals or cavities between or among the cells and are filled with the particular product of the plant." Not so with the lower forms of fungi. Their roots may grow in profusion, although frequently torn to pieces, because of their simple form of structure and habits. A single cell of mycelium will germinate, bud, or reproduce its kind as perfectly as will a spore of its fruit. In this case the lower forms of fungi have a decided

advantage over the higher organized plants. Climatic conditions wholly unfavorable to the growth of the latter are highly favorable to that of the former.

Probably the true remedies for the evils complained of consist in thorough drainage, proper culture of the soil, moderate manuring, and destroying the cocci and fungi by frequent washings with weak alkaline solutions, such as potash, soda, or ammonia.

Orange-plants confined within glass structures suffer a great deal from insects and fungi, and the remedy in use in such cases consists in thorough washing with soap and water, and the free use of a soft brush. Frequent washings are necessary.

At page 115 of the annual report of the Department of Agriculture for 1855 is published an interesting description of the habits of the orange-scale insect, by the entomologist of the Department, in which he proposes to syringe the plants affected with a solution of guano. Its ammonia destroys the young cocci as they emerge from the shelter of the parent scale, while the droppings enrich the soil.

As the growth of the black fungus seems so intimately connected with the presence of the orange-scale cocci, I would recommend that the insects be first destroyed by the washes proposed, and then the fungus and rust will disappear from the plants with a rapidity in proportion to the attention bestowed upon their cultivation, provided the climatic conditions are favorable to their growth.

FOREIGN DEMAND FOR WHEAT.

We have repeatedly shown it to be the policy of nations to supply their own people with wheat and other bread equivalents, and that few fail to do so, and fewer still undertake as a permanent policy the production of cereals for exportation. Among these Russia and the United States are the most prominent, and France and Germany always export something, and often partially balance exports by subsequent imports. Great Britain is the only regular and extensive purchaser. That the reader may study the wants of Great Britain, and means of supply, the following table is given, compiled from the official records of British imports.

A statement showing the sources of supply of wheat to Great Britain, as presented in official tables of imports, being the total imports of wheat and flour (in equivalent weight of grain) of fifteen years.

Year.	United States.	Russia.	Germany.	France.	British America.	Other countries.	Total.
	Cwt.	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*
1858	4, 782, 785	2, 653, 883	4, 210, 117	5, 581, 064	702, 838	5, 270, 254	23, 201, 941
1859	430, 504	3, 837, 454	4, 561, 521	8, 124, 978	170, 821	4, 372, 456	21, 497, 734
1860	9, 315, 125	5, 659, 971	6, 904, 819	4, 583, 412	1, 310, 652	4, 067, 947	31, 841, 926
1861	15, 610, 472	4, 540, 483	6, 658, 462	1, 359, 882	3, 387, 949	6, 089, 457	37, 646, 705
1862	21, 765, 087	5, 755, 785	7, 930, 849	1, 961, 835	5, 118, 698	7, 510, 140	50, 042, 394
1863	11, 869, 179	4, 538, 934	5, 728, 626	1, 857, 403	3, 198, 187	3, 695, 563	30, 887, 892
1864	10, 077, 431	5, 129, 410	6, 842, 721	2, 854, 421	1, 831, 897	2, 101, 320	28, 837, 203
1865	1, 498, 579	8, 093, 989	7, 224, 371	6, 058, 902	528, 456	2, 439, 255	25, 843, 552
1866	986, 229	9, 181, 432	6, 801, 657	8, 023, 530	59, 601	4, 319, 230	29, 371, 679
1867	5, 091, 733	14, 166, 794	7, 873, 216	2, 140, 832	835, 006	9, 029, 199	39, 136, 780
1868	6, 753, 389	10, 055, 338	7, 224, 597	846, 863	798, 505	10, 827, 353	36, 506, 045
1869	15, 320, 257	9, 187, 236	7, 546, 688	2, 153, 350	3, 396, 511	6, 843, 730	44, 447, 772
1870	15, 057, 236	10, 326, 844	4, 487, 773	1, 060, 120	3, 402, 690	2, 571, 452	36, 906, 115
1871	15, 625, 331	15, 689, 943	4, 258, 823	182, 262	3, 782, 776	4, 823, 092	44, 362, 227
1872	9, 634, 349	17, 938, 977	5, 183, 601	4, 553, 781	2, 157, 170	8, 145, 018	47, 612, 896

This makes a total of 528,141,861 cwt. of wheat, (or its equivalent in flour,) imported into Great Britain in the past fifteen years. This is a yearly average of 35,209,487 cwt., or 65,724,319 bushels of sixty pounds each. The requirements of the past five years have exceeded this average, though in 1870 by a small excess. The amount for 1872 is about eighty-eight million bushels. Many have supposed that Russia is the heaviest contributor to these supplies, but these official figures show, when subjected to analysis, that the United States furnishes the largest proportion, the total for fifteen years being 143,817,686 cwt., or 27 per cent. of all, while the proportion for Russia is 24 per cent., or 126,756,477 cwt. Germany (exclusive of the duchies up to 1860) contributes 17 per cent., (93,437,841 cwt.,) and France 9 per cent., (51,342,638 cwt.) British America has sent 5 per cent. These prominent contributions (with fractions of percentage omitted) make 84 per cent., leaving but 16 to all other sources of supply.

The absurdity of the theory that there is a surplus of wheat produced is strongly shown in the fact that only the United States and Russia are reliable in a series of years for any surplus whatever, that their excess is nearly all required to make up the deficiency of a single country, and that there never is any other outlet for such excess. Estimates have been rife, in commercial quarters, of a requirement of two hundred millions of bushels by nations having deficient wheat-crops. It is utterly impossible to find such a surplus, if necessary, or indeed much more than half of it. If official and other accounts are true the aggregate wheat exports of each nation of the continent of Europe, minus its imports, will scarcely exceed the exports of this country, though there will be exports from Russia, although her accustomed home supply may be short, and replaced in part by coarser grains.

The following table gives the official figures for nine months of 1873, with the cost in dollars, and the cost per bushel:

Quantities and declared value of British imports of wheat and wheat-flour for the nine months ending September 30, 1873.

	Importations.		Declared value.		United States gold value.		Value per cwt.	
	1872.	1873.	1872.	1873.	1872.	1873.	1872.	1873.
Wheat from—	*Cwt.*	*Cwt.*						
Russia	12,983,710	7,319,200	£7,583,886	£4,577,332	$37,919,430	$22,886,660	$2 92	$3 13
Denmark	153,196	257,184	100,919	173,478	504,595	867,390	3 29	3 32
Germany	2,740,997	1,412,575	1,840,650	1,002,320	9,203,250	5,011,600	3 36	3 55
France	743,560	1,169,193	480,377	746,892	2,401,885	3,734,460	3 23	3 18
Austrian territories	42,232	15,009	25,229	10,239	126,145	51,195	2 99	3 41
Turkey, Wallachia, and Moldavia	727,543	279,974	387,914	162,310	1,939,570	831,550	2 66	2 97
Egypt	1,777,045	1,136,748	881,505	624,436	4,407,525	3,122,180	2 48	2 74
United States	5,344,619	13,065,441	3,437,847	8,479,601	16,189,235	42,398,005	3 14	3 24
Chili	1,170,359	1,317,840	767,768	824,258	3,838,840	4,121,290	3 28	3 12
British North America	637,662	2,013,042	415,093	1,321,974	2,075,465	6,609,870	3 25	3 28
Other countries	1,076,982	2,773,199	717,628	1,875,000	3,588,140	9,375,000	3 33	3 38
Wheat-meal and flour from—								
Germany	700,581	463,707	644,283	455,741	3,221,415	2,278,705	4 60	4 89
France	508,668	1,577,774	455,029	1,504,746	2,275,145	7,523,730	4 47	4 77
United States	345,192	936,392	277,524	823,143	1,387,620	4,115,715	4 02	4 39
British North America	199,238	318,995	173,918	282,434	869,590	1,412,170	4 36	4 42
Other countries	664,447	1,352,216	679,967	1,304,046	3,399,835	6,520,230	5 12	4 82

FACTS FROM VARIOUS SOURCES.

THE WHEAT EXPERIMENTS OF LAWES.—The experiments of Mr. J. B. Lawes, of Rothamstead, England, in growing wheat continuously on the same plots, one unmanured, one treated with farm-yard manure, others with commercial fertilizers, are well known, having been continued now twenty-two years. The following table gives the production for each of the past eleven years, the average for that period and also the average for twenty-two years:

Bushels of dressed corn per acre.

Harvests.	No manure. Plot 3.	Farm-yard manure. Plot 2.	Artificial manures.			Means of plots 7, 8, and 9.	Means of plots 3, 2, 7, 8, and 9.
			Plot 7.	Plot 8.	Plot 9.		
1863	17¼	44	53⅜	55⅝	55½	54⅓	38⅘
1864	16½	40	45⅝	49⅝	51	49	35⅛
1865	13½	37½	40½	43⅝	44	42⅝	31
1866	12⅜	32⅜	30	32½	32½	31⅓	25¼
1867	8⅞	27⅛	22½	30½	29½	27¼	21½
1868	16⅝	41⅝	39⅞	46½	47¾	44⅓	34⅘
1869	14¼	32½	28½	31¾	39	34⅜	28⅝
1870	15	30½	40½	45½	45½	43⅓	31½
1871	9¼	39	22½	27⅝	34⅝	28½	25½
1872	10½	32⅜	29¾*	35½	40¾	35⅝	26½
1873	11¼	26¼	22	27½	35⅞	28½	*22⅔
Average for eleven years, 1863–'73	13½	36	34	39	41⅝	38½	†29½
Average for twenty-two years, 1852–'73	14¼	35½	34⅜	37¾	37	36⅜	‡28⅜

Weight per bushel of dressed corn.

Harvests.	No manure. Plot 3.	Farm-yard manure. Plot 2.	Artificial manures.			Means of plots 7, 8, and 9.	Means of plots 3, 2, 7, 8, and 9.
			Plot 7.	Plot 8.	Plot 9.		
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
1863	62.7	63.1	62.5	62.3	62.1	62.3	62.7
1864	62.0	62.5	63.1	63.5	62.6	63.1	62.5
1865	60.6	61.5	61.6	61.4	61.1	61.4	61.2
1866	61.3	61.7	61.0	60.1	60.6	60.6	61.2
1867	54.1	61.4	61.0	60.7	59.9	60.5	59.4
1868	61.0	61.6	61.1	62.7	61.1	61.4	61.3
1869	56.1	56.9	57.4	57.2	57.1	57.2	56.8
1870	61.7	63.4	63.3	63.0	62.7	63.2	62.8
1871	54.8	60.0	56.6	57.7	58.6	57.6	57.5
1872	50.0	60.7	60.2	60.4	60.0	60.2	60.0
1873	57.0	57.1	58.1	56.9	57.1	57.0	*57.4
Average for eleven years, 1863–'73	59.3	61.0	60.4	60.5	60.3	60.4	†60.2
Average for twenty-two years, 1852–'73	57.6	60.0	59.2	59.0	58.4	58.9	‡58.8

* Equal to 21 bushels at 61 pounds per bushel. † Equal to 22¾ bushels at 61 pounds per bushel.
‡ Equal to 27⅜ bushels at 61 pounds per bushel.

Mr. Lawes gives the following statement in explanation of the peculiarities of the season, with deductions from the tabulation above presented:

In my letter published in the Times of September 29, last year, I stated that the season of 1870–'71 was, for artificial manures, much less favorable, but for farm-yard manures considerably more favorable than the average; and that, consequently, the calculated average from my produce, which is considerably influenced by the results obtained by artificial manures, would probably give a figure too low for the average produce of the country at large in 1871; while, on the other hand, as the season of 1871–'72 was, compared with the average, more unfavorable for farm-yard than for artificial manures, the figure derived from the experimental results of 1872 would probably be too high for the average yield of the country in that year. A correction was accordingly made, and the imports of the year have shown that the estimate of the average crop of the country so arrived at must have been extremely near to the truth.

In the present season the unmanured produce is higher than in 1872, and considerably higher than in 1871. On the other hand, reducing the produce in each case to bushels of 61 pounds, that by farm-yard manure is nearly 7 bushels per acre lower than in 1872, and nearly 13 bushels lower than in 1871; and the mean produce of the three artificially manured plots is more than 8 bushels below that of last year, but almost identical with that of 1871.

Taking the mean of the produce without manure, with farm-yard manure, and of the three artificial manures taken as one, we have 22⅝ bushels of grain per acre, of 57.4 pounds per bushel, which, reckoned at 61 pounds per bushel, represents only 21 bushels. This is from 4 to 5 bushels less than the average taken in the same way last year, and nearly 7 bushels less than the average of twenty-two years. In fact the produce by farm-yard manure and by the various artificial manures agrees very closely with that under the same conditions in the very bad season of 1867.

Reduced to 61 pounds per bushel, the average produce of the selected plots in the experimental wheat-field in 1873 is about 24 per cent. below the average of twenty-two years. Much of this great deficiency is due to the fact that there was, in all, about double the average fall of rain during the four months of October, November, December, and January, the effect of which would be to wash beyond the reach of the roots a large amount of the nitrogenous manure which had been applied in the autumn. It is established that that most important and costly constituent of manure, nitrogen, especially when applied in the soluble form of ammonia, is largely converted into nitrates in the soil, and is, in that condition, washed away into the drains or the subsoil when there is an excess of rain. The loss of effect thus arising is strikingly illustrated by a comparison of the produce of the two plots, No. 7 and No. 9. Both received the same amount of nitrogen per acre, which was applied as ammonia salts in the autumn to plot 7, and as nitrate of soda in the spring to plot 9. The result was that while the autumn-sown ammonia salts yielded 22 bushels, the spring-sown nitrates yielded nearly 33 bushels. Again, another plot which received the same amount of ammonia salts as plot 7, but applied in the spring instead of the autumn, yielded nearly 33 bushels.

The loss of the nitrogen of manure by winter drainage would be the greatest where guano, ammonia salts, or other very soluble nitrogenous manure was sown in the autumn, less where farm-yard manures are employed, and still less where wheat was grown after.

FORESTRY.—An "international congress of land and forest culturists" held in Vienna in September, presided over by the Austrian minister of agriculture, passed resolutions petitioning the Austrian government to take measures for inaugurating international treaties with other European states intended to secure the protection of birds useful in agriculture; another series, declaring the lack of scientific basis for land and forest culture, and the necessity of official publications of exact statistical comparative data illustrating the status and progress of each country in these departments of industry; and a third relative to the necessity of action toward forest preservation, as follows:

1. We recognize the fact that, in order to effectually check the continually increasing devastation of the forests which is being carried on, international agreements are needed, especially in relation to the preservation and proper cultivation (for the end in view) of those forests lying at the sources and along the courses of the great rivers, since it is known that, through their irrational destruction, the results are great decrease of the volume of water, causing detriment to trade and commerce, the filling up of the river's bed with sand, caving in of the banks, and inundations of agricultural lands along its course.

2. We further recognize it to be the mutual duty of all civilized lands to preserve

and to cultivate all such forests as are of vital importance for the well-being—agricultural and otherwise—of the land, such as those on sandy coasts, on the sides and crowns as well as on the steep declivities of mountains, on the sea-coasts and other exposed places, and that international principles should be laid down, to which the owners of such protecting or "guardian forests" be subject, thus to preserve the land from damage.

1. We recognize further that we have not at present a sufficient knowledge of the evils (disturbances in nature) which are caused by the devastation of the forests, and therefore that the efforts of legislators should be directed to causing exact data to be gathered relating thereto.

It was stated, in the course of the proceedings, that the Rhine, the Oder, the Elbe, and other European rivers have lower water-marks than formerly; at Altenbruch, in Hanover, ten Hamburg feet lower in 1857 than a half century before; that part of the kingdom of Wurtemburg had been reduced to comparative barrenness by the felling of trees; that droughts were increasing in severity in Hungary, a fact popularly attributed to the deforestation of the country.

The case of the region near Trieste, on the Adriatic, was particularly referred to. It was stated that five hundred years ago a heavy forest covered that region, which was destroyed by the Venetians for the purpose of securing pile-timbers and lumber for commerce, and that after the trees were felled the unprotected soil was washed away by storms, and the whole face of the country became a dreary waste. In August last we passed through that region, and noted it as one of the most desolate views presented by any country. The surface far away from the coast was completely covered with ledges and rough bowlders, was almost destitute of soil, and the heat radiated from the rocks was intolerable. In parts of this broad belt some millions of olive-trees have been planted by the Austrian government, the soil for the purpose being transported in baskets in some places. It is stated that the rains, which twenty-five years ago ceased to fall here, are again appearing to refresh the scene.

Similar statements were made relative to local ameliorations by forest-planting on the coasts of Germany, in Upper Egypt, and at Ismaila, and in other countries.

Trans-Missouri Irrigating Convention.—Delegates from States and Territories west of the Missouri met in convention at Denver on the 21st of October, to take preliminary steps toward concerted action, by interested States and Territories and the national Government, for constructing a general system of irrigating works for the whole western arid region. Kansas, Nebraska, Colorado, Utah, New Mexico, and Wyoming were represented by delegates; Arizona, Montana, and Dakota by letters from their respective governors; and Nevada by a letter from Senator J. P. Jones. R. W. Furnas, governor of Nebraska, presided.

Hon. S. H. Elbert, governor of Colorado, stated in his opening address that the meridian of Fort Kearney, the ninety-ninth west from Greenwich, constitutes a dividing line in the physical characteristics of the continent, west of which is found about half the area of the United States, and except a tract along the Pacific coast and a small area of river valleys, it is without sufficient rain to be available for agriculture, though exceedingly productive with irrigation. Two great parallel mountain chains, the Sierra Nevada and the Sierra Madre, traversing the entire domain from South to North, eight hundred miles in average breadth of intervening plateau, cut and gorged by great rivers and divided into hydrographic basins of great extent by transverse mountain-chains; the great plains descending by the gentlest slopes from the bases of the

Sierra Madre eastward to the prairie lands of the Missouri; rivers and smaller streams sweeping down from the mountain flanks and threading valley and plain, as arteries of the human system, constitute the grand physical outlines of this arid region. He stated that in France irrigated lands rent at $21 per acre, and unirrigated at $16. In 1856, 247,000 acres had been brought under irrigation in that country, and since then the quantity had been rapidly increasing. The irrigated lands of Granada, Mercia and Valencia, amounting to 500,000 acres, are considered the gardens of Spain.

Mr. R. A. Cameron, of Larimer County, Colorado, stated that in his section irrigation has cost $7 per acre; in Utah, $13; in Lombardy, $16. On an irrigated farm near Greeley, a farmer with an outlay of $48, and the work of one pair of hands, raised, in one season, produce which yielded him $4,000.

Mr. A. M. Musser reported that in Utah there are now about 140,000 acres under irrigation, and claimed an increase of rain as one of the results. Up to 1865, over 277 canals and ditches had been constructed for irrigation; of these the aggregate length was 1,043¾ miles, and the total cost $1,776,939; average cost per mile, $1,695. The amount expended on canals and dams in the fiscal year ending October, 1867, was $248,000. The number of acres irrigated that year, 100,000; acres of wheat, 48,000; average yield per acre 17⅝ bushels, (one-sixth of the crop being lost by the ravages of locusts and grasshoppers;) of barley, 6,300, average yield 18 bushels, loss one-fourth; of oats, 1,900, average yield 20 bushels, loss one-third; of corn, 7,900, average yield 15 bushels, loss one-fourth; of potatoes, 6,300, average yield 100 bushels, loss one-fourth; of meadows, 30,000, average yield 1¾ tons, loss one-eighth. Of 25 canals representing all sections of the Territory, the average dimensions are, length, 6⅛ miles; width at bottom, 6½ feet; depth of water, 15½ inches; fall, per mile, 23⅞ feet; average number of acres watered by each, 1,638. Mr. Musser said:

> Our *reclaimed* alkali lands, of which we had many thousand acres, are among our richest, strongest, and consequently most remunerative soils. The mode of reclamation is simply by leaching the land by elaborate irrigation and by repeated plowing; thus exposing it to the direct influence of segregating elements which carry off the volatile and objectionable ingredients. When Salt Lake City was first founded the water capacity for irrigating purposes did not exceed 800 or 900 acres. Now between 4,000 and 5,000 acres are successfully irrigated. At first the land was arid and thirsty. Subsequent irrigation saturated and settled the soil and thus slaked much of its early thirst. The increase of rain-fall, no doubt superinduced by agriculture, occupation, and cultivation, and the numerous fruit and shade trees, like so many mulch-agencies, neutralizing the drying effects of the sun's rays and prevailing winds, has very largely contributed to cool and moisten the soil and to lessen the necessity for frequent and elaborate watering. After successive years of watering the upper or bench lands, we discover that the lower lands, including much arable and about all the grass-lands, received about all the water they needed through the percolating course of the waste waters alone.

Mr. Benito Baco, of San Miguel County, New Mexico, stated as evidence of the necessity of irrigation, that in his county over 150,000 sheep were lost in one season simply for the want of water.

Mr. F. J. Stanton expressed the opinion that irrigation even in Iowa and Illinois would insure 25 or 30 bushels of wheat to the acre, instead of 12½, and that "every foot water travels in a ditch it acquires fertilization and food-property for vegetation." He stated that the annual deposit from the Mississippi had been estimated at 28,188,053,892 cubic feet of solid matter, exclusive of the coarse sand and gravel transported by the current; also that the Rhine annually carries down 1,973,433 cubic feet. He estimated the reclaimable area in Colorado 25,000,000

acres. Others made much lower estimates. Governor Elbert claimed that Colorado alone has a water-supply for irrigating 6,000,000 acres—an area equal to that which in the days of the Ptolemies, in Egypt, supplied food for a population of 8,000,000.

The convention unanimously recognized the necessity for aid by the National Government, as the only authority having jurisdiction and capable of giving unity and efficiency to a system permeating several States and Territories, and as the principal landholder and party to be benefited.

The convention, after deliberating two days, in extended day and night sessions, adopted unanimously a memorial to Congress, reciting that the arid region of the United States, embracing over one-third of the area of the country, or more than one million square miles, in the Territories of New Mexico, Arizona, Colorado, Wyoming, Utah, Idaho, and Montana, the State of Nevada, and large portions of the States of Oregon, California, Nebraska, Kansas, and Texas, and of the Territories of Washington and Dakota, is generally unfit for profitable cultivation without irrigation; that the water supply is abundant for reclaiming millions of acres; that a system of irrigation suited to the wants of this region is too expensive for individuals, associations, or Territorial or State governments; that vast areas of land must long remain unsold and unavailable for agriculture without such a system of internal improvement; that the small areas available for settlement by present means of irrigation are now nearly exhausted; that such a system might be incidentally useful in driving the machinery of thousands of gold and silver mines now unworked for lack of water; and, therefore, praying for the passage of a law embodying the following general provisions:

First. To grant to the several States and Territories named in the preamble to this memorial one-half of all the arid lands not mineral within their borders, said lands, or the proceeds thereof, to be devoted to the construction of irrigating canals and reservoirs for the reclamation of said arid and waste lands.

Second. That the construction and maintenance of irrigating canals and reservoirs shall be under the exclusive control and direction of the Territory or State, as sole owner thereof, under such laws, rules, and regulations as the legislature thereof shall from time to time provide.

Third. That the Territorial and State legislatures shall have power to make all needful rules and regulations, and take all needful steps for the proper construction and maintenance of such canals, and that such power shall include the power to provide, by laws for the issuing of the bonds of the Territory or State, for the construction of such canals.

Fourth. That the proceeds of said lands herein granted shall be kept as an exclusive fund by the Territory or State, first, for the payment of the principal and interest of all bonds so issued as aforesaid; second, that any balance remaining after the payment of the bonds so issued as aforesaid shall be used in the maintenance of said canals, or the construction of other canals, as the legislature of said Territory or State shall from time to time by law direct.

Fifth. That any lands within said Territory or State which shall be filed on under the provisions of the pre-emption and homestead laws of the United States, after the passage of this act, shall be subject to the operation of this act, if the said lands shall be brought under irrigation by the construction of said canals.

Sixth. That the bonds so donated to the several States and Territories herein named, and the remainder of the public domain therein belonging to the General Government, shall be disposed of under revised and more strict pre-emption and homestead laws than are now in force, and that no title shall issue until the claimant shall be a *bona-fide* actual settler upon the land claimed.

MANUFACTURE OF PAPER FROM HOP-STALKS.—M. Jourdeil, of the department of the Côte d'Or, in France, has recently submitted to a congress of paper-makers of that country an invention, or rather a series of inventions, for separating and using the textile material which envelops the stalk of the hop, in the manufacture of paper. The experiments with this new fiber have already reached some remarkable results,

and great confidence is indulged that a discovery has been made which will prove of great interest and value to agriculture as well as to the paper-making industry.

RICE IN MARYLAND.—A farmer of Wicomico County, Maryland, (eastern shore,) reports that from one quart of rice, planted in deep, black soil, he raised twenty-four quarts, weighing twenty-eight pounds. It was planted about the middle of April, in rows 18 inches apart, and cut October 27. Single grains produced from five to twenty-five stalks, from 3½ to 5 feet high.

NOTES ON BERMUDA GRASS (*Cynodon dactylon*) IN THE SOUTH.—Dr. St. Julian Ravenel, of South Carolina, states that by the use of nitrates and alkalies in solution he produced hay from Bermuda grass at the rate of sixteen tons to the acre.

Planters at the South have considered this grass a pest, but in the present condition of affairs the old notions are being revised and the grass considered a blessing on some of the needy plantations. The great objection to it has been that it is hard to eradicate; nevertheless, at all times its reliability for a hay-crop and for grazing in the hot climate of the South has been well understood. Dr. Howard, of Georgia, an authority on grasses at the South, thinks that where Bermuda grass has thoroughly taken possession of the soil it will force the owner to raise live stock or abandon the land; and that if the worn soil is ever to be restored it will be by sheep and Bermuda grass, or grass of similar characteristics. In passing, it may be in place to refer to Dr. Howard's opinion of Bermuda grass as expressed in one of the annual reports of the then Bureau of Agriculture:

> It will live on land so poor as to be incapable of supporting other valuable grasses, though its value is in proportion to the fertility of the soil. It seems to be determined that below the mountainous parts of the Southern States, if stock be kept away from Bermuda grass during the summer and autumn, although the ends of the grass may be nipped by frost, that there will be sufficient grass underneath to feed stock during the winter. This being the case, it must stand unrivaled as a grazing-grass in the Southern States, taking into the account the whole year, both summer and winter. On very rich land it grows tall enough to be made into hay, and the hay is of the best quality.

The same writer quite recently published the statement that there are thousands of acres of land well set in Bermuda grass in the middle counties of Georgia; that the cotton-planters, who are wholly indifferent to stock-raising, still detest the grass because it is hard to kill, and interferes with their staple. He says that for spring, summer, and autumn grazing he has seen nothing equal to it in Old England, New England, or the West; if cut in August, it gives very good winter-grazing, horses, cattle, sheep, and hogs all being fond of it. Mr. Howard has so thorough a faith in the excellencies of this grass that he asks the question, "Why should men go West when they can accomplish such results at the South?"

Bermuda grass is propagated by roots and not by seeds. The smallest fragment of root will grow with a slight covering of earth. A single shoot will sometimes run 10 feet or more in a single season on rich land, each point putting out roots. An agricultural journal of Alabama recommends the following mode of planting this grass:

> Break the land well and harrow up fine, then cut your Bermuda sod into small bits, say one inch square. Drop these bits over the ground 3 or 4 feet apart and roll down level with a heavy roller. If your sod is scarce, you may make your pieces much smaller than an inch square; every root with an eye in it will grow if put into the ground. In cases where no roller is at hand, the dropper of the sod may make all right by treading upon each bit as he drops it. It is always best to start Bermuda in land

not too poor; if in good condition, the grass will keep it so, and it spreads and covers the ground much more rapidly. If you cannot plow your pasture-land, you may still seed it to Bermuda by simply digging small holes (a blow with a grub-hoe will answer) and dropping the seed into them. It will spread over land that has never been plowed, though with less rapidity, of course. Bermuda grass cannot stand any great amount of shading, hence the pasture should be pretty clear of trees.

WHITE SCHÖNEN OATS.—A farmer of Coos County, Oreg., reports that he sowed two quarts of white Schönen oats on 19 rods of ground, and gathered 485 pounds, or at the rate of 113 bushels per acre, although about two rods of the sowing lodged and was badly cut up by rabbits. On a particular spot of one square rod the yield was 30 pounds, or at the rate of 133 bushels per acre. The uniform height of the stalks was 6¼ feet, with heads from 18 to 20 inches long. The yield was double that of the common varieties.

ADAMS' EARLY CORN.—A correspondent of Powhatan County, Va., says that this is decidedly the best garden-corn he ever planted. He intends next season to plant it as a field-corn, with the expectation of getting corn-meal by the 1st of September. This year he planted April 22, and gathered August 15, when it was hard enough to grind. While it bears, generally, not more than two ears to the stalk, the ears are large and well filled, and seem to be less subject to the attack of the worm which usually infests the early varieties.

SWEDISH TURNIPS.—A farmer in Washington Territory reports that from seed obtained from the Department he raised Swedish turnips of very superior quality, the largest of which weighed from 26 to 30 pounds. The summer was unusually dry, but he succeeded by frequently watering the beds after transplanting.

AGRICULTURE IN INDIA.—Mr. W. R. Robertson recently delivered an address at the British Museum, Madras, which represents the agriculture practiced in India as of a very primitive and superficial character. The only implement used in working the soil is a very imperfect one, passing under the name of plow, which, instead of turning over the surface, leaves it in its original position, and seldom stirs it to a depth greater than 4 inches, in consequence of which only insufficient nutriment is available for plants, and the effects of prevalent droughts are rendered unnecessarily disastrous. For the same reason crops are easily prostrated by storms. Scarcely anything is done in the way of keeping up the fertility of the soil by the use of manure or other fertilizers. The crops being of a low, unimproved order, possess a degree of native hardiness by which they will survive a considerable amount of unfavorable weather and of hard usage; but they are very poor in quality and the yield per acre is exceedingly meager, the seed being stinted and the quantity of husk out of all proportion to that of grain or seed. In the Madras presidency, out of more than 20,000,000 acres devoted to food-grains or plants, less than 25,000 are under wheat, and less than 30,000 under sugar-cane. "The ryot (Indian farmer) cannot, on his exhausted upper soil, grow the higher order of crops unless he improves his practice; this is why all the attempts to improve cotton, tobacco, and Carolina paddy (rice) cultivation, by distributing good seed over the country, have not met with satisfactory results. A high order of plants, like a high order of animals, demands favorable circumstances." Mr. Robertson thinks that, with proper cultivation, wheat could be grown extensively, and sugar-cane on the greater portion of the area under cultivation in the presidency. The condition of live stock is represented to be extremely wretched. There are over 7,000,000 cattle and over

6,000,000 sheep, for which neither pasture nor fodder food is provided. "By far the greater number of live stock of the presidency are kept, during two-thirds of the year, just above the starvation point. The result of such management is that disease is seldom absent from the herds and flocks of the ryot, producing, at times, frightful loss."

JUTE AND RAMIE IN LOUISIANA.—Mr. E. Le Franc, president of the Southern Ramie Planting Association of New Orleans, La., writes as follows to the Department in regard to recent experiments with jute, and incidentally refers to ramie:

I have the pleasure to inform you of the success of our jute experiment conducted on an adequate scale. To find out the best time for planting, we put in seed at intervals from April to July. All plantings up to the end of June did well; that of a later period failed to attain the average height, which is here 6 feet—in rich land 8. Manual labor, such as that employed in the jute industry of the East Indies, could not be employed here, because too high-priced and unskilled. We have treated the jute by machinery. Our ramie machinery, recently improved, cleans the jute perfectly in its green state. It gives a crude but neat product which, being rotted, is a beautiful and lustrous fiber. Jute culture cannot fail to be profitable, inasmuch as it requires small capital. The following is a statement of approximate cost:

Cultivation, per acre	$5 00
Cutting, decortication, and manufacture	15 00
Implements and interest on capital	5 00
	25 00

Average yield per acre, on common land, 1,500 pounds.

Offered price for the crude fiber, 4 cents per pound; for rotted, 8 cents.

Of course the crude fiber would cost less to the planter; being the direct product from the machine, it would save at least $5 per acre for manipulation by the rotting process. The raw fiber is a new element for rope manufacture and other coarse industries. It is very strong, and has all the natural qualities of its native condition. We believe that as a material for cordage, in place of common Manila at 9 and 10 cents, it ought to bring at least 6 and 7 cents, and save millions of importation. At all events, we can now proclaim as easy and feasible, jute culture in America. It depends upon the planters to extend it. Ramie, as well as jute, is gaining ground; the mechanical problem is solved. Hemp and flax can also be cleaned by the machinery adapted to ramie and jute.

Having noticed in one of the agricultural reports that cotton, surrounded by a belt of jute, was protected thereby from attacks of caterpillars, I made the experiment, and found the statement to be correct. There were no worms in the field, although situated in lowlands of the suburbs of New Orleans, while some adjacent plantations were visited by the insect. I have also observed that no flies or butterflies ever go to the jute flower.

STATISTICS OF MONTGOMERY COUNTY, IOWA.—The rapid progress of western settlement can be illustrated by facts from almost any county beyond the Mississippi. The official census of Montgomery County, Iowa, for 1873, gives the following results: Acres of land improved, 67,890; products of 1872, in bushels: wheat, 229,632; corn, 1,647,893; oats, 287,915; barley, 11,019; pounds of wool, 7,024. The returns of corresponding items in the same county, in 1869, for the United States census, were as follows: Acres of improved land, 30,284; bushels of wheat, 59,712; of corn, 323,168; of oats, 37,393; pounds of wool, 18,492. No barley was reported for 1869. By comparing the two series, it appears that, within the short space of four years, the quantity of land improved was more than doubled, and, within three years, the production increased, of wheat, nearly four-fold; of corn, more than five-fold; and of oats, more than seven-fold. On the other hand, the production of wool fell off 62 per cent. The census for 1873 makes the number of inhabitants 8,602.

CONSUMPTION OF COTTON.—M. Ott-Trümpler, in his annual report of cotton deliveries (from ports to the interior) for consumption in Eu-

rope for the year ending October 1, 1873, makes the total number of bales 5,219,000; of which 3,335,000 bales were distributed in England; and 1,884,000 on the Continent. The English supply was received, 1,654,000 bales from America, 737,000 from India, 509,000 from Brazil, 306,000 from Egypt, and 129,000 from other countries; the continental, 669,000 bales from America, 795,000 from India, 144,000 from Brazil, 87,000 from Egypt, and 189,000 from other countries. He reports the annual supply of the past twelve years as follows:

Year.	England.	Continent.	Total.
	Bales.	*Bales.*	*Bales.*
1872–'73	3, 335, 000	1, 884, 000	5, 219, 000
1871–'72	3, 132, 000	1, 641, 000	4, 773, 000
1870–'71	3, 222, 000	2, 046, 000	5, 268, 000
1869–'70	2, 760, 000	1, 627, 000	4, 387, 000
1868–'69	2, 587, 000	1, 916, 000	4, 503, 000
1867–'68	2, 822, 000	1, 782, 000	4, 604, 000
1866–'67	2, 414, 000	1, 733, 000	4, 147, 000
1865–'66	2, 319, 000	1, 616, 000	3, 935, 000
1864–'65	1, 873, 000	1, 182, 000	3, 055, 000
1863–'64	1, 565, 000	1, 033, 000	2, 598, 000
1862–'63	1, 332, 000	814, 000	2, 146, 000
1861–'62	1, 217, 000	776, 000	1, 993, 000

IRRIGATION IN INDIA.—The "imperial budget statement" for the government of India, for 1873–'74, besides an estimate of £2,354,000 (exclusive of the appropriations for roads and civil buildings) for ordinary public works, includes a proposed grant of £3,878,000 for extraordinary public works. Of this, £1,226,000 are intended for carrying forward canals of irrigation already in process of construction, that is, "the canals from the Jumna, near Agra, the Lower Ganges Canal, the canal from the river Soane, and the completion of the canal-system in the deltas of the Kistna and the Godavery, the improvement of the Western Jumna Canal, and the Moota project in the Bombay Presidency."

The canal revenue superintendent of the Cuttack district, in Bengal, reports to the irrigation branch of the public works department of Bengal upon irrigation in cotton-culture as follows:

In the Cuttack district only two varieties of cotton are grown, viz, the *haldiya* and the *achna*; the former is, generally speaking, the cotton of the hills and rainy season; the latter of the plains and dry season. It will be convenient to describe the mode of cultivating them separately. The haldiya variety is sown in June and July, and picked in October and November. Though generally grown in the Gurjects, where newly reclaimed jungle-land is largely available and best suiting the crop, it is also occasionally met with in the delta of the Mugulbundi, but in very small quantities, and grown either on land reclaimed from jungle or else within the precincts of the ryot's own homesteads. It is but rarely grown on the ordinary *dofasli* or biyali lands. But little care is given, I believe, to its cultivation, the earth being turned over as for rice, and the plant left to itself with the exception of an occasional weeding.

The *achna* variety is sown in November, December, and January on the dofasli or biyali lands, and is picked in May, June, and July. The seed used is the seed of the haldiya variety, and the ordinary mode of cultivation is as follows: The land is allowed to lie fallow for the whole of the rainy season, the rotation of crops being as follows: (1) biyali, followed by biri, mug, linseed, or other similar crop; (2) fallow; (3) cotton. The land is plowed at the end of November, in December, or at the beginning of January, as may happen to suit the rain-fall, the closing of the canals, or the ryot's convenience, and is brought into the ordinary conditions of garden-soils. Whatever manure the ryot has to spare (which is generally so little and of such a quality as to be of but little benefit) he puts down. The soil is then worked up into ridges, and the seed dibbled in by hand, five or six seeds in each place at intervals along the ridges of about a foot. To prepare the soil water is required; and, as a rule, cotton is not grown

in any place where there is not a supply of water of some kind. The soil is moist below where the seed is put down, though dry above.

When the plants are about half a foot high and there has been no rain, the first watering is given, and this is continued at intervals of about fifteen days until the middle or end of May, when the crop is in full flower. The first and last waterings are the most important of all. The method of watering is peculiar. A small channel is made from the source of the water-supply to the highest point in the cotton-field, from whence it can be distributed. Within the field there are small subsidiary channels connected with that leading to the field. When the water is first turned on, the mouths of the small channels are closed, and the whole supply is allowed to go into the principal channel. The ryot then takes his stand about ten yards from the mouth and bunds the channel at his feet. As the water comes down he throws it forward right and left with a scoop (*sena*) made of very light wood, (of the simul or cotton-tree,) with a piece of string which he holds in the left hand while he holds the handle in his right. When all the cotton within reach of his first position has been thus sprinkled with water, and the ground thoroughly saturated, the ryot opens the bund and lets down water to the next reach of ten yards, and so on until the whole of the land covered by the sub-channel has been watered, when he proceeds to use the other sub-channels in the same manner until the whole field has received water. Cotton is never irrigated in the ordinary manner by flooding the roots, the cultivators declaring that water unless given from above kills the crop. I have invariably noticed that any crop which has by accident been flooded, even slightly, has suffered considerably. If you call a ryot who is engaged in watering cotton in the ordinary method as above described, he will invariably shut off the water at the source of supply before he comes to you. Any excess of water, such as percolation, entirely ruins the crop. To the eye there is but little perceptible difference, in an ordinary year, between an irrigated crop of cotton and one which has had nothing but rain-water, but the ryots say that there is a great difference in yield independently of the appearance of the plants. Two or three days after each watering, when the upper crust of the soil has got caked and *sour*, (if I may so describe its greenish appearance,) the cultivator takes his kodal and digs the whole field, completely turning over the soil and eradicating all weeds. When the plants are about to come into flower they are thinned, not more than three or four being left in the same place. If they are unusually large and leafy, the tops are nipped off, or calves turned in to graze for a few hours to prevent their running too much to wood, and bearing less flower. The plants vary in height from 2 to 5 feet when in full growth. As the cotton becomes ready for picking, the whole family turns out and collects the pods as occasion demands. The picking begins in May and lasts until July; the crop, however, requires no water after the former month. As no difference is made in the treatment of the two varieties of cotton after they have been picked, one description of their subsequent treatment will do for both. The cotton is first dried in the sun; when dry, the seed is removed, and the cotton, after being cleaned, is worked into thread by the women of the family and sold at the *hats* or to itinerant dealers. This description applies only to the lower classes and Mussulmans, who generally have only just enough for home consumption. The Brahmins and better class of ryots grow cotton on advances made by local mahajuns, to whom they deliver it, and who again resell it at the *hats*, or for export in the same form as the specimens forwarded with my letter dated 1st March, 1873. In this form and in that of thread it is *alone* procurable in the markets, and not in large quantities in either. If, as is probable, the cultivation of this crop should be in future largely extended by means of irrigation, and the supply become greater than the local demand, it may be worth while to try an experimental cleaning-mill worked by water power, and let out by contract to a large dealer in cotton, who would send it, when cleaned, to Calcutta. At present anything of the sort would be certain failure, the supply being little, if any, in excess of the amount that can be worked up by the women of the poorer classes.

COFFEE-CROP IN CEYLON.—The Ceylon Observer reports that in all the older districts of that island the coffee-crop will be very short this year. In districts where the rule has been 10 to 12 cwt. per acre, the yield this year will not be over 1 to 3 cwt. per acre. But while on the plantations generally the crop will approach a failure, "the native gardens" promise a full yield. "In the Matella districts the native coffee (last year supposed to be dying out from leaf-disease) is in splendid order and bearing heavily. Scarcely a trace of leaf-disease is to be seen this season on places that but a year ago were covered with it."

GUINEA GRASS, (*sorghum vulgare.*)—A small quantity of the seed of this grass having been received from Thomas H. Pearne, United

States consul at Kingston, Jamaica, a portion of it was sent by the Department to a planter in Florida for purposes of experiment. Some of the seed was sown on the 20th of May, on common pine land, slightly manured with cotton-seed. Although not coming up as well as expected, it stooled out, sending out from fifteen to sixty stalks to the seed, and by August 1 was over 5 feet high and very thrifty. Three weeks after the first a second sowing was made on lower and wetter ground; but this did not grow quite as well as the first, although sending out more shoots to the seed, one stool having one hundred stalks in the bunch. A few stalks were cut and planted to test rapidity of growth. The center shoots of these stalks grew as much as 2 inches in twenty-four hours, and 14 inches in one week—indicating, in the experimenter's opinion, that it might be cut to advantage once a month. It did not appear to be affected by drought, and our correspondent says that if it is found to ratoon well (sprout or spring up from the root, as in the sugar-cane from the root of the previous year's planting) on the poor pine lands in Florida its introduction will prove of inestimable value, as there is no reliable forage-grass now cultivated or growing wild in the State.

The following is quoted from a communication to the New York Tribune (October 15) on "hay-making at the South," by C. Tennant Lee, of Dallas County, Alabama:

An exceedingly profitable business, which has sprung up in the last two or three years, is hay-making, from what is known hereabouts as the Johnson grass, after the name of the man who brought it here from South Carolina. It produces a heavy hay, nutritious and palatable to all stock, but it has a single drawback—the seed from it is dangerous; the more widely the hay is sold the worse will be the spread of a grass that takes complete possession of the land. Under the (I believe) correct name of Guinea-grass, many will know it to their sorrow. In three years' time a field once started with it is gone for any cultivation.

Something as fine as the Guinea-grass, and at the same time harmless, is what is here called water-grass. It flourishes in the bottoms of the plowed fields where the ground is moist, and on common land grows 5 and 6 feet tall. The stem is sweet as sugar-corn, and the head which tops the seed-stem is often a foot long, and rich with seeds, which stock eat with avidity. In this country it is regarded as the best grass for hay, horses preferring it to crab-grass or timothy. The head, when first forming, is green, and then a bright red, after turning to a brown. Cut in season, three crops can be easily made from it—a ton, and even two tons, to the acre at a cutting. I cannot learn that this hay has ever been marketed; but this year much has been made, and I expect to see a high price realized from it. Certainly, these facts given do not indicate that the South is moving in a wrong direction.

In his report of experiments on the Madras (India) experimental farm, 1873, Mr. Robertson, in charge, speaks very favorably of Guinea-grass. The better he becomes acquainted with it the more he values it. He refers in a deprecating manner to the erroneous ideas prevalent in regard to the grass, ascribing them to superficial observation and limited experience. Among these false notions he mentions these: That Guinea-grass must be irrigated, not only at the time it is planted, but regularly at stated intervals afterward; that it must be taken up and be replanted on new ground at the end of every two years at the furthest; and that the fodder is *not* a suitable food for stock, and can only be used in small quantities for such a purpose. Mr. R. has fine crops which were never irrigated; a field planted four years ago, which is as flourishing now as at any time, while some of the best results have been obtained in fattening stock with this grass. But the grass must not be planted in the hot season, or during dry weather, when the soil is devoid of moisture; cloudy and showery seasons ought always to be chosen. The methods pursued on the Madras farm are thus given:

Plow, scarify, and weed the land thoroughly; harrow, roll, and pulverize to a fine

tilth; then ridge with the plow, making the ridges at distances of about 2 feet. Manure is then spread in the open furrow between the ridges. The plow is then passed along the line of the ridges, splitting them in the center, and throwing the soil over the manure on either side. The chain-harrow or the roller is then passed along over the surface of the ridges to consolidate them, and the plants (obtained by dividing into several parts old tussocks from another field) are planted on the ridge on the first showery day afterward, care being taken that they are planted uniformly at a distance of 2 feet apart in each direction; thus admitting of the plow being used between the lines of plants and across these lines at right angles. The after-cultivation is simple; little weeding is required if the crop was well manured at planting, but it is advisable to pass the plow or cultivator occasionally through and across the crop, as the absorptive powers of the soil can in this way be kept up. This plowing or cultivating should be repeated at any rate once after the removing of each cutting. A dressing of fold-yard manure should be applied between the plants and plowed in at least once a year. Before the end of the second year the plants, from frequent cutting, will have formed large tussocks. These must be reduced by simply chopping with a hoe or spade. We find it best to make two cuts across the tussocks at right angles to each other, thus dividing it into four parts. Of these, three are removed, and form excellent bedding for the cattle-stalls, the fourth remaining to perpetuate the crop. In this way there is no necessity to remove the plants to other ground, but care must be exercised to see that the soil is *properly* manured, as a crop which yields such *large* returns must necessarily make large demands on the soil.

As to its uses the report says:

The fodder can be used for all kinds of stock; at first, it seems to disturb the digestive organs of some animals, but this is only temporary. I have fed cattle and sheep on it *exclusively* for *months*, not only without any ill effects, but with the most satisfactory results. I have found our Guinea-grass field a capital place in which to graze our working cattle during the hot season, and for the ewes with young lambs I could scarcely desire a better pasture. It produces such an abundant flow of milk in the ewes, without, what is common in such cases, disturbing the health of either mother or lamb.

JUTE IN PAPER-MAKING.—The use of jute as a paper material will greatly increase the commercial value of this valuable fiber. The Dundee Advertiser, (Scotland,) on its appearance printed on jute paper, after apologizing for its transparency and thinness, says:

A remarkable fact is that it is the product of Mr. Watson's second experiment, and if we can attain to such a result on only a second trial there need be no fear with respect to further experiments. The thinness and transparency will easily be remedied, as there is nothing to prevent paper made from jute being of any degree of thickness and opaqueness. It may be explained that this sample is made almost entirely from old jute-bagging. We propose to have samples made entirely from jute-fiber. To some extent jute bagging and waste have been used by paper-makers for several years, mixed with other materials; and when we mention that nearly 50,000,000 jute bags were exported last year—the demand for home requirements being also very large—it will be seen how large a quantity of manufactured jute there is to work upon, especially as bagging is only one class of the goods made from this material.

PRODUCTS OF THE PUNJAB.—The province of India known by this name yields cotton, sugar-cane, tea, rice, tobacco, and other valuable articles of commerce. Rice is cultivated to the largest extent in the Kangra, Ambalah, Sielkote, Hushiarpur, and Gurdespur districts. Wheat and other food-grains and pulses are grown everywhere. The chief poppy-growing districts are Ambalah, Sharpur, and Kangra. Tobacco cultivation is pretty general, though the greatest area is in the districts of Delhi, Firozpur, Amietsur, Gujronwala, Hushiarpur, Gurdespur, and Sielkote. Cotton is grown generally in all districts, but the chief cotton-producing tract is the Delhi and Hissar divisions. The cultivation of indigo is confined almost exclusively to the three districts of Multan, Muzaffargarh, and Derah-Ghazi-Khan. Tea is grown only in Kangra, while the sugar-cane is grown generally.

EFFECTS OF FREE TRADE ON AGRICULTURE IN INDIA.—Fifteen years of open competition with the remainder of the world is producing discouragement and industrial loss in India. The decline in native

manufactures in the province of Oudh, where the population is 500 to the square mile, has been serious in its results, causing a transfer of capital and labor from the dying trades to agriculture. The result is thus stated:

We say nothing of the numbers who were supported by military service, probably 200,000, including the King's army and the retainers of the talookdars. The transfer of their labor from unproductive to productive employment must benefit the country. But the suppression of the manufacture of arms and salt and of the timber trade probably threw 200,000 more people upon the land. The two great weaving castes, the Julahs and the Korees, number more than half a million. We believe about half of them have been driven by competition with Manchester to abandon the manufacture of cloth and betake themselves to agriculture. The same result, but to a less extent, has followed in the case of many other professions. Potters, dyers, cloth-stampers, cotton-combers and cleaners, workers in metal and glass, and makers of fancy articles, too many to enumerate, have forsaken their hereditary trades, and are now found as cultivators of the soil. This has been the only alternative open to them. The system of caste prevents the Indian artisan from transferring his scanty capital, or his skilled labor, from one profession to another. But every Hindoo is more or less an agriculturist, and when other trades fail the land suggests itself as the natural resource.

We believe we are within the mark in stating that, of the eleven million inhabitants of Oudh, about one million have, since the annexation, been converted from traders and manufacturers into agriculturists, either as cultivators or farm-laborers, and that nine millions of acres are now cultivated instead of six. These new agriculturists are unskilled in husbandry, and their labor is expended on the less fertile land of the province.

It cannot be doubted that the return they obtain from the land for their labor and capital is far less than that which they obtained from their respective trades. No writer on political economy seems ever to have anticipated the possibility of such a result of free trade as has occurred in Oudh, the transfer of the capital and labor of a million of artisans from a more to a less productive industry. Such a result cannot but be accompanied with a decrease of the total wealth of a country. And the problem is complicated by other considerations. It must be borne in mind that for every acre taken up for the plow, there is one acre the less for the plow-oxen. The diminution of the area available for grazing cattle has of late years attracted the attention of many settlement officers. In many parts of Oudh the pasture-lands are miserably insufficient, and the wretched leanness of the cattle announces the fact to the most careless observer. Of course the result of ill-fed oxen is a diminished supply of manure available for the land, a result which is also effected in another way. For the clearance of the jungles to make way for the advance of the plow deprives the people of wood for fuel; they are therefore compelled more and more to consume the manure of their cattle for fuel, instead of devoting it to its legitimate purpose of fructifying the exhausted soil.

SOIL-EXHAUSTION THROUGH EXPORTATION.—Mr. Robinson, of Madras, recently delivered an address at the British Museum on modern agriculture, in which he made the following statements:

There is a time when every exporting country discovers that exhaustion follows an injudicious exporting trade. The great grain-exporting countries of Europe have already learned this; tracts of country which at the beginning of the export trade yielded large crops of wheat, produce now only one-half, in some instances even less. Thus, in the richest soils in the south of Russia, on which the yield was formerly 40 bushels, the yield is now only 18 bushels. In Poland the result is even worse, and in Dantzic the yield has sunk to 14 bushels. The suicidal agriculture followed in the United States of America has produced the same results. Only eighty years ago the average yield of wheat per acre in the State of New York was 24 bushels; now it is only 15 bushels. In Virginia, which only one hundred years ago contained some of the richest tracts of land in the world and produced large crops, the yield is now, on some of the best of the old arable lands of the State, under 8 bushels per acre. The culture of cotton, tobacco, and maize for export, year after year, on the same land, without a particle of manure, accounts for this; and the same explanation accounts for the thousands of acres of abandoned land on the eastern side of America, which the advancing settler exhausted and abandoned in his westward march; land with which the American Government is perplexed how to deal, the cost of restoring the exhausted elements of fertility being so much greater than the possible value of the land when restored. But so it is in every country and in every district from which the produce has been exported, and in which no attempt has been made to restore the gradually exhausting fertility. A time will come when remunerative cultivation will be impossible, and the land must either be abandoned or put through an expensive course of restorative treatment.

SOIL-EXHAUSTION AND CHEAP LANDS.—It appears that even in India it is becoming understood that land under cultivation is liable to decrease in fertility where wild or new lands can be had at a very cheap rate. The Agricultural Gazette of India says:

It will be a good thing for Ceylon when the last acre of jungle available for coffee has been felled; for not till then is the necessity for a liberal system of manuring likely to be recognized. Cheap land means, generally, in a few years exhausted land. If the original outlay can be returned in four or five years without manuring, it is useless to expect men to lay out a lot of money, which will only delay this wished-for return.

THE COTTON-CROP IN AUSTIN COUNTY, TEX.—The secretary of the Agricultural Society of New Ulm, Austin County, Tex., reports to this Department that the past season has proved a very unpropitious one to the cotton-crop in that section. Owing to the cold spring the crop was about a month later than usual; then the cotton-worm came a month earlier than in 1872. As some fields escaped the ravages of the worm the yield is exceedingly variable, being not above one bale of 500 pounds of ginned cotton to 12 acres in some places, and three and four times as much in others. The crop is inferior in quality to that of 1872, requiring some 200 pounds more of rough cotton to make a bale of ginned. Our correspondent represents that the results of experiments in trying to destroy the cotton-worm with Paris green, as reported, are so conflicting that he is unable to arrive at any satisfactory conclusion respecting them.

COTTON YIELD GREATER THAN ANTICIPATED.—The secretary of the Farmers' Society, Pendleton, Anderson County, S. C., reports that, in that section, the cotton-crop turns out better than it promised in September. This is owing to the facts that the fall has been unprecedentedly favorable for picking, and that, though the rust and worm appeared in that upland locality more generally than heretofore known, yet in cases where the attack was not too early and where the growth was very luxuriant, the check thus occasioned proved a benefit rather than an injury.

SUCCESSFUL FARMING.—Judge F. M. Wood, of Barbour County, Ala., is reported as having cultivated, the past season, one acre of "poor, sandy land," on which the only fertilizer used was 80 bushels of cotton-seed, with the following results: He sowed it, in January, with oats, from which he gathered 4,606 pounds in the sheaf, and, at $1.50 per hundred-weight, realized $69.09. In June he planted corn, and among it, at the suitable time, sowed pease. He gathered 14¾ bushels of corn, worth $1 per bushel; 8¾ bushels of pease, worth $1.50 per bushel; and 486 pounds of fodder, worth $1 per hundred pounds; the total amounting to $101.82. These crops having been all harvested, the land is now sowed in rye for winter pasturage.

EXPERIMENT IN WINTERING STOCK.—In an address before the National Stock Growers' Convention, recently held at Kansas City, J. C. Febles, editor of the Colorado Farmer, says:

One of our farmers, engaged in mixed husbandry, as an experiment last winter, sheltered and fed hay to, when the severity of the weather required it, a lot of three-year-old steers. Another lot of the same age, size, and condition, as near as possible, he permitted to run at large without shelter or extra feed, as is the usual custom. The winter was an unusually mild one. A few weeks ago the farmer sold both lots of steers and realized a profit of over 100 per cent. on the hay fed, over and above that for which the other cattle sold in the market.

Mr. Febles brings forward this experiment to show the advantages of mixed husbandry over a system of exclusive stock-raising in large herds; and in the same connection he urges that it is impracticable to improve

breeds of cattle, to any extent, where the latter system prevails. The farmer who unites other agricultural industries and sources of profit with stock-growing has facilities and advantages for sheltering, feeding, and improving generally his smaller herd, which the exclusive stock-grower must needs lack.

STATISTICS OF KANE COUNTY, UTAH.—A correspondent sends us the amounts and current prices of the principal agricultural products of this county in 1872. The amount of wheat was 2,900 bushels; corn, 2,000; barley, 2,500; potatoes, 5,000; butter, 4,000 pounds; cheese, 3,000. The price of wheat, $1.25 per bushel; corn, $1.10; barley, $1.10; potatoes, 50 cents; butter, 25 cents per pound; cheese, 20 cents. Compared with the census returns for 1869 this shows an increase in wheat of 74 per cent.; (no barley was reported in 1869;) in butter of 14 per cent.; in cheese of 22 per cent.; and a decrease in corn of 61 per cent., in potatoes of 20 per cent.

SUFFERING FROM DROUGHT.—A correspondent in Washington County, Iowa, reports that in that locality the severe drought of summer is protracted through the autumn. Wells and streams have generally dried up, and stock are suffering for water. Many cattle have to be driven miles to the principal streams, and even in them water is scant. Owing to the great scarcity of water, thousands of wells have been dug during the fall.

RENEWAL OF WHEAT CULTURE.—A correspondent in Sebastian County, Ark., reports that the culture of wheat, after having been almost abandoned in that locality, has now taken a new start, and thousands of acres will be sown this autumn for the first time.

MULTIPLICATION OF DESTRUCTIVE INSECTS.—A correspondent in Anderson County, S. C., reports that in that region insects have done more injury to crops and other vegetable growths the past season than he has ever before known. Even the forest-trees have been stripped of their foliage to an unprecedented extent.

CROPS IN JEFFERSON COUNTY, NEBR.—The secretary of the Jefferson County Farmers' Club reports that the wheat-crop in that county was good, yielding about 20 bushels per acre. The yield of oats was about 40 bushels per acre. Corn was only about half a crop, and poor in quality. Potatoes were all taken by the bugs. Wheat, before the panic, brought 75 to 85 cents per bushel; since that brings 60 cents; corn, 30; oats, 25; and potatoes, $1.

PRICES IN UNION COUNTY, IOWA.—A correspondent in the above named county reports, October 1, that corn was selling on the street at 20 cents per bushel; potatoes were selling at 50 cents, and the price advancing, as the crop was short. Prairie hay was in good demand, at $4 per ton, and timothy at $6.50, the supply of both being short, owing to dry weather in the growing season.

CROPS IN HOLT AND ATCHISON COUNTIES, MO.—Our meteorological correspondent in Holt County states that in the northern part of Holt and southern part of Atchison, winter-wheat yielded about half a crop, but of first quality; spring-wheat was good, averaging about 20 bushels per acre, of fair quality. His field of 40 acres yielded 775 bushels, which sold in Saint Louis for $1.15 per bushel. What he paid out for help in harvesting, (not counting his own work,) thrashing, and freight amounted to 35 cents per bushel. Corn in the section, which promised as good a crop as ever grew, was shrunk by drought to about

three-fourths of an average. On his farm, being on the Missouri bottom, the yield was about equal to last year's in bulk, but lighter in weight. His surplus of 2,000 bushels he has sold in the field, jerked but not husked, for 30 cents per bushel, which is "much better than last year's price." He also has in crib 3,000 bushels of last year's crop, which is selling in the ear at 35 cents per bushel. Early Rose potatoes yielded about an average crop; other varieties about one-third.

WABAUNSEE COUNTY, KANS.—The rapid increase of cultivation in Kansas is shown by a comparison of the census statistics with the latest returns of the assessor of this county, as well as the change from corn-planting to wheat-growing, in consequence of last year's experience with cheap corn. The probable yield of this year is the result of careful local estimate. Horses have increased since 1870 from 1,983 to 2,534; mules from 97 to 114; swine from 1,466 to 3,670; catttle from 6,570 to 10,229; while sheep have decreased from 862 to 781. The quantity of butter has increased since 1869 from 69,685 pounds to 109,562, and of cheese from 12,054 to 33,245 pounds. The crop comparison is as follows:

	1869.	1872.	1873.
Corn, bushels	220,365	526,577	309,218
acres planted		21,992	11,893
yield per acre		43¾	26
Wheat, bushels	63,451	29,974	67,693
acres sown		1,826	4,835½
yield per acre		16½	14
Oats, bushels	28,243	77,550	79,530
acres sown		2,115	2,651
yield per acre		36¾	30
Barley, bushels	1,874	13,115	8,030
acres sown		539	401½
yield per acre		24½	14
Rye, bushels	640	2,362	4,935
acres sown		164	329
yield per acre		20½	15
Irish potatoes, bushels	35,669	65,790	28,880
acres planted		612	722½
yield per acre		107½	40

BRITISH IMPORT OF WOOL.—The importations of wool into Great Britain during the nine months ending September 30, in 1872 and 1873, as shown by official reports, were as follows:

	Quantities.		Values.	
	1872.	1873.	1872.	1873.
	Pounds.	*Pounds.*	*Cts. per lb.*	*Cts. per lb.*
Europe	29,852,064	23,586,368	28.6	28.6
South Africa	24,749,204	31,325,860	32.4	34.1
British India	16,617,885	15,787,373	22.2	22.7
Australia	164,866,694	177,150,277	31.1	31.5
Other countries	27,425,838	21,052,187	23.4	33.3
Total	263,511,685	268,902,065	29.6	30.5

NORTHWESTERN TEXAS.—One of our correspondents having emigrated from Louisiana to a frontier settlement in Hood County, on the Brazos River, Texas, sends us some account of the geographical and agricultural conditions of that section. The face of the country is di-

versified with rugged hills and beautiful valleys. Cliffs often rise abruptly from the banks of the streams to the height of one hundred feet or more. In the valleys the land is very fertile, producing cotton, wheat, corn, oats, barley, rye, &c. In 1872 some of the wheat-lands of the better quality yielded a fraction over 45 bushels per acre. But in Hood County the larger part of the land is not adapted to tillage, though some of the elevated plateaus, which are post-oak lands, produce very good crops. Water is abundant, since, in addition to the Brazos River, small streams abound. Wood for fuel is plenty, though good timber for building is somewhat scarce. Agriculture is generally in an unimproved and, in some respects, a primitive, state. Our correspondent expresses his intention of doing what he can toward awakening a new interest and developing the resources of the county. Among its other attractions, he specifies more than a dozen "very fine white-sulphur springs."

ESPARTO-GRASS.—The rapid increase in the demand for this fibrous product, (*Macrochloa tenacissima*,) chiefly as material for paper, is indicated by the following facts: It was first brought to notice in 1862, when a single cargo was sent to England from the province of Oran, in Algiers. The result of this experiment was that the export from this same province rose from 10,000 quintals in 1863 to 370,000 in 1870 amounting in value, in the latter year, to $1,500,000.

NEW PAPER-FIBER.—According to the Agricultural Gazette of India, a common weed, called *Sida retusa*, growing in great abundance in Queensland and New South Wales, has recently been found to afford a very valuable material for paper-making. It is a species of *malvaceæ*, and the best specimens of it grow about Windsor, New South Wales, where it is known as American lucerne. It is alleged to be of such vitality and vigor of growth as to be almost ineradicable, and to grow in such profusion as to be a very troublesome weed; to be very superior to esparto-grass, clean, easily bleached, and having all the best qualities of flax. "Samples of the *Sida retusa* having been submitted to the chief paper manufacturers in England, one and all have agreed in expressing their most favorable opinion of its perfect adaptability to the purpose of paper-making, and all entertain a very high estimate of its market value." Various species of sida are represented to be common throughout India. One, *Sida piliafolia*, referred to by Dr. Forbes Boyle, in his work on Indian fibers, is said to be cultivated in China for its fiber, as a substitute for hemp and flax. Dr. Roxburgh describes its fiber as "strong and pliable, very silky in its nature, and the plant of very rapid and luxuriant growth, three crops being obtained in one year."

HEALTH FROM FLOWERS.—It is reported that an Italian professor has discovered that perfumes from flowers have a chemical effect on the atmosphere, converting its oxygen into ozone, and thus increasing its health-imparting power. As the result of his researches he states that essences of cherry, laurel, lavender, mint, juniper, melons, fennel, and bergamot are among those which develop the largest quantities of ozone, while anise and thyme develop it in a less degree. Flowers destitute of perfume have no such effect. He very naturally recommends that dwellers in marshy localities and near places infected with animal emanations should surround their homes with a profusion of the most odoriferous flowers—a recommendation which the Creator, through their beauty and fragrance, addresses to the senses of all sensible people.

NEW SALMON-FISHERY LAW.—The British Parliament has recently enacted a law explaining, amending, and adding to existing statutes relating to salmon-fishing. Its design is to make the regulations more stringent and effective. The provisions of the "malicious injuries act," so far as they relate to poisoning water with intent to destroy fish, are made to apply to salmon rivers. It provides that "no person shall buy, sell, or have in his possession any salmon or part of any salmon between the 3d of September and the 1st of February following, both inclusive; and any person acting in contravention of this section shall forfeit any salmon so bought, sold, or exposed for sale, or in his possession for sale, and shall incur a penalty not exceeding £2 for every such salmon or part of any salmon." This is not to apply to salmon cured beyond the limits of the United Kingdom, or within the limits between the 1st of February and the 3d of November, nor to any clean, fresh salmon caught within the limits of the act, or beyond the limits, provided the capture was lawful; but the burden of proof that it was lawful, in either case, is to lie on the person "in whose possession for sale such salmon is found." No draught-net is to be shot within 100 yards of another net before the latter is landed; no fishing except with rod and line is to be permitted 100 yards above or below weirs or mill-races; no eel-baskets are to be fixed between the 1st of January and the 24th of June; and no interference with salmon is to be permitted in close seasons. These are the prominent features of the act, which contains sixty-five sections and three schedules.

MARKET PRICES OF FARM-PRODUCTS.

The following quotations represent the state of the market, as nearly as practicable, on the 1st day of November, 1873:

Articles.	Price.	Articles.	Price.
NEW YORK.		NEW YORK—Continued.	
Flour, superfine State...per bbl.	$5 20 to $5 75	Cheese, State factory.....do...	$0 13 to $0 14
extra State .....do...	6 00 to 7 00	western factory .....do...	— to —
superfine western ...do...	5 20 to 5 75	Cotton, ordinary to good ordinary .....per lb.	13⅛ to 14⅛
extra to choice western, per barrel	6 00 to 10 75	low middling to good middling ..... per lb.	14⅜ to 16⅜
common to fair, extra southern .....per bbl.	6 20 to 6 95	Sugar, soft yellow .....do...	8¼ to 9⅜
good to choice southern, per barrel.....	7 00 to 11 00	soft white.....do...	9½ to 9⅝
Wheat, No. 1 spring ...per bush.	1 40 to 1 44	Tobacco, lugs, all grades, per pound.....	6½ to 7¼
No. 2 spring .....do...	1 34 to 1 40	common to medium leaf .....per lb.	8 to 10
winter, red, west'n, poor to choice ....per bush.	1 41 to 1 50	Wool, American XXX and picklock.....per lb.	58 to 62½
winter, amber, western, per bushel	1 51 to 1 55	American X and XX, per pound.....	49 to 52
winter, white western, per bushel	1 45 to 1 70	American, combing..per lb.	57 to 63
Rye.....per bush.	88 to 95	California spring clip, per pound	25 to 35
Barley .....do...	1 00 to 1 30	California fall clip, per pound	20 to 27
Corn .....do...	60 to 62	Texas .....per lb.	18 to 35
Oats .....do...	45 to 49	BOSTON.	
Hay, first quality .....per ton.	26 00 to 28 00		
second quality.....do...	22 00 to 25 00		
Pork, mess .....per bbl.	14 90 to 15 00		
extra prime .....do...	13 90 to — —		
prime mess .....do...	15 50 to 16 00	Flour, western, superfine..per bbl.	5 00 to 5 50
Lard .....per lb.	7½ to 7¾	western extras .....do...	5 75 to 7 50
Beef, plain mess.....per bbl.	8 50 to 10 00	western choice .....do...	8 00 to 11 00
extra mess .....do...	10 00 to 12 00	southern extras.....do...	6 00 to 6 50
Butter, western .....per lb.	18 to 31	choice Baltimore ....do...	9 00 to 11 00
State dairy .. ..do...	25 to 38	Wheat.....per bush.	1 50 to 1 85

Market prices of farm-products—Continued.

Articles.	Price.		
BOSTON—Continued.			
Rye.....per bush	$0 95	to	$1 00
Barley.....do...	1 30	to	1 70
Oats, western.....do...	49	to	55
Corn, southern yellow.....do...	68½	to	69
western yellow.....do...	68½	to	69
Hay, eastern and northern, per ton.....per ton	18 00	to	26 00
Hay, western choice.....per ton	24 00	to	25 00
Beef, western mess.....per bbl	8 00	to	11 50
western extra.....do...	11 50	to	12 50
Pork, prime.....do...	14 50	to	15 00
mess.....do...	15 75	to	16 00
Lard.....per lb.	8½	to	9
Butter, N. Y. and Vt., common to choice.....per lb	20	to	38
western, fair to extra, per pound	22	to	30
Cheese, N. Y. and Vt. factory, choice, per pound	14	to	14½
western factory, choice, per pound	13½	to	14
Sugar, fair to good refining, per pound	7	to	7½
Cotton, ordinary to good ordinary.....per lb	13	to	14½
low middling to good middling.....per lb	14½	to	16
Tobacco, lugs.....do...	7½	to	9
common to medium leaf.....per lb.	9	to	10
Wool, Ohio and Pa.....do...	45	to	48
Michigan.....do...	42	to	48
other western.....do...	42	to	48
pulled.....do...	20	to	50
combing fleece.....do...	52	to	58
California.....do...	15	to	35
Texas.....do...	18	to	30
PHILADELPHIA.			
Flour, superfine.....per bbl.	4 25	to	5 25
Pa. extra.....do...	5 25	to	5 75
Pa. family.....do...	7 50	to	8 00
western family.....do...	7 25	to	8 75
western, fancy.....do...	9 00	to	10 00
Wheat, winter red, western, per bushel	1 45	to	1 52
Pennsylv'nia red, per bus.	1 50	to	1 56
Pennsylvania, Delaware, and western amber, per bushel	1 55	to	1 65
white.....per bush.	1 75	to	1 88
No. 1 spring.....do...	1 38	to	— —
Rye, western.....do...	85	to	86
Corn, western yellow.....do...	62	to	63
Oats, white.....do...	47	to	50
Barley, New York 4-rowed.do...	1 50	to	1 57
western.....do...	1 40	to	1 55
Hay, fresh baled.....per ton.	24 00	to	28 00
common and fair shipping, per ton	20 00	to	22 00
Pork, mess.....per bbl	16 00	to	— —
prime mess.....do...	14 50	to	— —
prime.....do...	13 00	to	— —
Beef, western mess.....do...	8 00	to	10 00
extra mess.....do...	9 00	to	12 00
Warthman's city family, per pound	15 00	to	— —
Butter, choice Middle States, per pound	34	to	36
choice western...per lb	25	to	30
Cheese, N. Y. factory.....do...	14½	to	15
Ohio factory.....do...	14	to	14½
Sugar, fair to good refining.do...	7	to	7½
Cotton, ordinary to good ordinary.....per lb.	11½	to	14

Articles.	Price.		
PHILADELPHIA—Continued.			
Cotton, low middling to good middling.....per lb.	$0 14¼	to	$0 17
Wool, prime X and XX....do...	50	to	—
Ohio X.....do...	50	to	—
Ohio combing, coarse.do...	57	to	—
prime tub, coarse....do...	51	to	—
BALTIMORE.			
Flour, superfine.....per bbl.	4 50	to	5 20
extras.....do...	5 50	to	8 50
family and fancy....do...	7 25	to	10 50
Wheat, white, fair to choice, per bushel	1 50	to	1 75
amber, choice..per bush.	1 65	to	1 75
red.....do...	1 35	to	1 62
Rye, common to prime.....do...	80	to	90
Corn, white southern.....do...	78	to	80
yellow southern.....do...	65	to	68
Oats, southern.....do...	50	to	53
western.....do...	48	to	50
Hay, western and Pa....per ton.	20 00	to	25 00
New York.....do...	22 00	to	25 00
Maryland.....do...	25 00	to	27 00
Pork, mess.....per bbl.	15 75	to	16 00
Beef, Baltimore mess.....do...	15 00	to	20 00
extra.....do...	23 00	to	25 00
Lard.....per lb.	7¾	to	8
Butter, western.....do...	25	to	32
eastern.....do...	24	to	30
Cheese, eastern cutting....do...	15	to	15½
western cutting...do...	15	to	—
Cotton, ordinary to good ordinary.....per lb.	11¾	to	13½
low middling to middling.....per lb.	14	to	14¾
Sugar, soft white A.....do...	10	to	10½
Tobacco, lugs.....per cental.	6 00	to	8 00
common to medium leaf, per cental	8 00	to	11 00
Wool, fleece-washed.....per lb.	45	to	50
tub-washed.....do...	55	to	60
unwashed.....do...	35	to	38
pulled.....do...	35	to	40
CINCINNATI.			
Flour, superfine.....per bbl.	4 75	to	5 00
extra.....do...	6 40	to	6 75
family and fancy....do...	6 75	to	8 25
Wheat, good to prime red winter, per bushel	1 32	to	1 35
hill, prime to choice, per bushel	1 40	to	1 50
white, prime to choice, per bushel	1 45	to	1 55
Rye.....do...	74	to	75
Barley.....do...	1 00	to	1 50
Corn.....do...	40	to	47
Oats.....do...	35	to	42
Hay, baled, No. 1.....per ton.	16 00	to	17 00
lower grades.....do...	12 00	to	15 00
Pork, mess, city packed..per bbl.	12 75	to	13 00
Lard.....per lb.	7	to	7¼
Beef, plate.....per bbl.	11 00	to	12 00
Butter, choice.....do...	28	to	31
prime.....do...	24	to	27
Cheese, prime factory.....do...	13¾	to	14
Sugar, N. O., fair to good....do...	9¾	to	10
N. O., prime to choice.do...	10¾	to	—
Tobacco, lugs.....do...	8	to	12
leaf.....do...	12	to	25
Cotton, ordinary to good ordinary.....per lb.	12½	to	13
low middling to good middling.....per lb.	13¾	to	14¾

Market prices of farm-products—Continued.

Articles.	Price.	Articles.	Price.
CINCINNATI—Continued.		**SAINT LOUIS—Continued.**	
Wool, fleece-washed, common to fine ...per lb.	$0 40 to $0 42	Cotton, low middling to middling ...per lb.	$0 13½ to $0 14
tub-washed ...do...	40 to 42	Wool, tub-washed ...do...	40 to 47
unwashed, clothing ...do...	25 to 27	fleece-washed ...do...	34 to 40
unwashed, combing ...do...	32 to 33	unwashed combing ...do...	23 to 33
pulled ...do...	30 to 32		
CHICAGO.		**NEW ORLEANS.**	
Flour, white winter, extras, per barrel	12 00 to — —	Flour, fine ...per bbl.	5 00 to 5 25
Flour, spring extras ...per bbl.	5 00 to 5 75	extras ...do...	6 25 to 8 50
Wheat, No. 1 spring ...per bush.	1 00 to 1 04	choice ...do...	8 75 to 9 75
No. 2 spring ...do...	99 to 1 02	Corn, white, ...per bush	80 to — —
No. 3 spring ...do...	95 to 96	yellow ...do...	80 to — —
Corn, No. 2 ...do...	36 to 36⅜	Oats ...do...	51 to 58
Oats, No 2 ...do...	29¼ to 29½	Hay, choice ...per ton.	27 00 to — —
Rye, No. 2 ...do...	60 to 60½	prime ...do...	24 00 to 25 00
Barley, No. 2 ...do...	1 23 to 1 25	Pork, mess ...per bbl.	15 50 to 16 00
Hay, timothy ...per ton.	11 00 to 15 00	Beef, Texas ...do...	10 50 to — —
prairie ...do...	8 00 to 10 00	northern and western, per barrel	14 00 to 15 00
Beef, mess ...per bbl.	8 00 to 8 25	Fulton market ...per ½ bbl.	10 50 to — —
extra ...do...	9 00 to 9 25	Lard ...per lb.	8⅝ to 10¼
Pork, mess ...do...	12 00 to 12 25	Butter, choice western ...do...	30 to — —
prime mess ...do...	10 50 to 10 75	choice Goshen ...do...	40 to — —
extra prime ...do...	8 75 to 9 00	Cheese, choice western factory, per pound	15 to 15½
Lard ...per lb.	6⅞ to 7	N. Y. cream ...per lb.	17 to — —
Butter, choice yellow ...do...	25 to 30	Sugar, fair to good fair ...do...	8½ to 9⅜
medium to good ...do...	19 to 24	light yellow clarified ...do...	10⅛ to 10⅝
Cheese, N. Y. factory ...per lb	13 to 13½	white clarified ...do...	11 to — —
Ohio and western factory ...per lb.	12 to 13	Cotton, good ordinary ...do...	14 to 14½
Sugar, N.O., choice ...do...	9¼ to 9⅝	low middling to good middling ...per lb.	14⅜ to 17
N.O., common to fair ...do...	7⅛ to 8⅜	Wool, clear lake ...per lb.	26 to 27
Wool, tub-washed ...do...	40 to 52	Louisiana, clear ...do...	19 to 21
fleece-washed ...do...	40 to 43		
unwashed ...do...	24 to 32		
pulled ...do...	35 to 38		
SAINT LOUIS.		**SAN FRANCISCO.**	
Flour, spring club ...per bbl.	6 35 to 6 60	Flour, superfine ...per bbl.	$5 37½ to 5 50
winter ...do...	3 25 to 8 65	extra ...do...	5 75 to 6 00
Wheat, spring, No. 2 ...per bush	1 00 to 1 12½	family ...do...	6 50 to 6 75
red winter, No. 2 ...do...	1 55 to 1 56	Wheat, California ...per cental.	2 15 to 2 35
white ...do...	1 40 to 1 70	Oregon ...do...	2 05 to 2 30
Corn, No. 2 ...do...	38 to 40	Barley ...do...	1 35 to 1 65
Oats, No. 2 ...do...	32½ to 34	Oats ...do...	1 40 to 1 65
Rye, No. 2 ...do...	61 to 64	Corn, white ...do...	1 25 to 1 35
Barley, No. 2 ...do...	1 00 to 1 15	yellow ...do...	1 25 to 1 30
Hay, choice ...per ton.	16 50 to 17 00	Hay, State ...per ton.	17 50 to — —
Pork, mess ...per bbl.	13 50 to 13 75	Pork, mess ...per bbl.	18 00 to 18 50
Lard ...per lb.	7 to 9⅜	prime mess ...do...	16 00 to $17 00
Beef, family, mess ...per bbl.	14 00 to — —	Beef, mess ...do...	10 00 to 11 00
Butter, choice dairy ...do...	30 to 32	Lard ...per lb.	10 to 12
medium ...do...	18 to 23	Butter, overland ...do...	20 to 25
Cheese, N. Y. factory ...do...	14 to 14½	California ...do...	30 to 35
Ohio and northwestern, per pound	13½ to 14	Oregon ...do...	15 to 20
Cotton, ordinary to good ordinary ...per lb.	11 to 11¼	Cheese ...do...	14 to 16
		Wool, native ...do...	13 to 14
		Californian ...do...	16 to 20
		Oregon ...do...	20 to — —

LIVE-STOCK MARKETS.

Articles.	Price.	Articles.	Price.
NEW YORK.		**NEW YORK—Continued.**	
Cattle, extra beeves ...per cental.	$12 00 to $12 25	Cattle, milch-cows with calves, per head	$40 00 to $80 00
good to prime ...do...	10 00 to 11 50	calves, milk-fed, per pound	07 to 10
common to fair ...do...	8 00 to 9 50	grass-fed, per head	5 00 to 7 50
poorest grade ...do...	5 00 to 6 00	Sheep, adult ...per pound.	04½ to 05
average ...do...	9 00 to 10 00	lambs ...do...	05 to 07
Texans ...do...	5 00 to 9 50	Swine ...do...	04½ to 04⅝

Live-stock markets—Continued.

Articles.	Price.		
BOSTON.			
Cattle, choice ..per cental.	$7 00	to	$7 25
extra.....do....	6 00	to	6 50
first quality .....do....	5 00	to	5 50
second quality.....do....	4 00	to	4 50
third quality .....do....	3 00	to	3 75
working-oxen... per pair.	100 00	to	250 00
milch-cows with calves, per head	35 00	to	60 00
extra.....per head.	70 00	to	100 00
farrow cows .....do....	15 00	to	40 00
Sheep, in lots .....do....	2 50	to	3 75
extra .....do....	4 00	to	4 87½
spring lambs...per pound.	04½	to	06½
Swine, fat western.....do....	05	to	05½
store hogs, wholesale do....	— —	to	07
PHILADELPHIA.			
Cattle, fair and choice beeves, per cental	5 00	to	7 00
common .....per cental	3 50	to	4 50
Sheep, fair to good.....do....	4 00	to	6 00
stock.....do....	2 50	to	3 50
Swine, corn-fed.....do....	5 50	to	6 82½
slop-fed.....do....	5 75	to	6 00
BALTIMORE.			
Cattle, best beeves....per cental.	4 87	to	6 12
first quality .....do....	4 00	to	4 87
medium or good fair quality.....per cental.	3 12	to	4 00
ordinary thin steers, oxen, or cows.....per cental.	2 50	to	3 12
general average of the market.....per cental.	4 25	to	— —
extreme range of prices, per cental	2 50	to	6 12
most of the sales...do....	4 87	to	4 75
Sheep, fair to good.....do....	4 00	to	4 75
good to extra.....do....	4 75	to	6 50
stock dull at.....do....	2 00	to	3 25
lambs .....per head.	2 00	to	3 50
Swine, corn-fed.....per cental.	6 00	to	6 50
still-fed.....do....	5 50	to	6 00
CINCINNATI.			
Cattle, common to medium, per cental.....	1 50	to	3 00
Cattle, good to prime..per cental..	4 00	to	4 75
Calves .....do....	5 50	to	6 00
Sheep, common to fair .....do....	2 50	to	3 25
good to prime.....do....	3 50	to	4 00
lambs .....per head.	4 50	to	5 75
Swine, light hogs.....do....	4 00	to	4 10
heavy .....do....	3 90	to	4 00
CHICAGO.			
Cattle, extra beeves, steers, 1,400 pounds and upward, per cental.....	5 60	to	5 80
choice beeves, fine, fat, well-formed, 3 to 5 years old, 1,300 to 1,450 pounds, per cental	5 25	to	5 50
good beeves, well-fattened, finely-formed steers, 1,200 to 1,350 pounds, per cental	4 50	to	5 00

Articles.	Price.		
CHICAGO—Continued.			
Cattle, medium grades, fair fleshed steers, 1,150 to 1,250 pounds, per cental.....	$4 00	to	$4 35
butchers' stock, common to fair steers and good to extra cows, 800 to 1,100 pounds, per cental.	3 00	to	4 00
stock cattle, decently fleshed, 700 to 1,050 pounds.....per cental.	2 50	to	3 65
Texans, choice corn-fed, per cental.....	4 25	to	4 75
Texans, north-wintered, per cental.....	2 75	to	3 75
Texans, through droves, per cental.....	1 60	to	2 50
Sheep, good to choice, per cental	3 50	to	4 00
poor to medium, per cental.	2 75	to	3 25
Swine, heavy .....do....	3 50	to	3 90
light.....do....	3 70	to	4 00
SAINT LOUIS.			
Cattle, choice native steers, 1,300 to 1,600 pounds, per cental.	5 00	to	5 50
prime second-class natives, 1,150 to 1,400 pounds, per cental.....	4 50	to	5 00
good third-rate natives, 1,050 to 1,300 pounds, per cental	3 75	to	4 25
fair butchers' steers, 1,000 to 1,200 pounds, per cental	4 00	to	4 50
thrifty stock-steers, 900 to 1,300 pounds, per cental	3 00	to	3 50
good to choice corn-fat Cherokees and Texans, per cental.....	2 50	to	4 00
inferior to common Cherokees and Texans, per cental.....	1 25	to	2 00
Sheep.....per cental.	3 00	to	3 62½
Swine .....do....	3 50	to	3 75
Horses, good working-animals, per head.....	100 00	to	125 00
heavy work-horses, per head	130 00	to	175 00
Mules, 14½ to 15 hands high, per head	85 00	to	100 00
15 to 15½ hands high, per head	110 00	to	145 00
15½ to 16½ hands high, per head	150 00	to	175 00
NEW ORLEANS.			
Cattle, Texas beeves, choice, per head	— —	to	50 00
first quality.....per head.	35 00	to	45 00
second quality.....do....	20 00	to	38 00
western beeves, net, per cental.....	10 00	to	12 50
milch-cows.....per head.	35 00	to	50 00
choice .....do....	80 00	to	100 00
calves .....do....	7 00	to	10 00
Sheep, first quality .....do....	4 00	to	5 00
second quality.....do....	3 00	to	4 00
Swine, gross weight..per cental.	6 00	to	7 00

FOREIGN MARKETS.

WHEAT.—The dependence of Europe upon American wheat was seldom more apparent or more distinctly recognized than at the present. British commercial journals awaited with some anxiety the result of our monetary crisis, especially with reference to its influence upon our breadstuffs export. The quality of American wheat of the crop of 1873 already received in England has given special satisfaction Supplies were arriving in excellent condition to an extent which visibly affected prices in the United Kingdom. Continental Europe, at the close of October, had shown no tendency to a large export. In France there was a continued though slow improvement of prices generally, though a few country markets showed a downward tendency. The French small farmers had generally sold out their stocks. Arrivals at Odessa and Taganrog were so moderate that exporters found the rates too high for profitable shipment to British markets. The harvests of Russia were so very unequal and the surplus crop of some provinces were required to meet the deficiencies of others to an extent which renders reliance upon that country, to say the least, very problematical. Germany manifested no anxiety for British orders. The local decline previously noted at a few points had ceased. The Mark Lane Express of October 27, in speculating upon the probabilities of a scarce winter, suggested that this country might meet an extra demand by an extra consumption of maize, a cereal which very poorly bears transportation. Australia was ready with a large shipment, and considerable supplies were hoped for from the west coast of South America, yet the general outlook was toward short supplies and high prices.

The last week of October opened upon small supplies of English wheat in Mark Lane markets, with heavy arrivals of foreign, more than half of which were from New York. Well-dried English samples sold at an advance of 1*s.* upon the previous rates: others were neglected. American red was rather against buyers. The London weekly averages for October were as follows: 63*s.* 5*d.* on 3,751 quarters; 63*s.* 7*d.* on 4,088 quarters; 63*s.* 9*d.* on 2,059 quarters; 62*s.* 0*d.* on 3,152 quarters. The imports of foreign wheat during those four weeks amounted to 3,723,116 quarters. Essex and Kent white wheat was quoted in Mark Lane at the close of October at 52*s.* to 66*s.* per quarter; ditto red, 54*s.* to 62*s.*; Norfolk, Lincolshire, and Yorkshire, 53*s.* to 58*s.* Foreign wheats—Dantzic, mixed, 62*s.* to 66*s.*; ditto, extra, 68*s.* to 71*s.*: Konigsberg, 62*s.* to 66*s.*; ditto, extra, 68*s.* to 71*s.*; Rostock, 61*s.* to 66*s.*; ditto, old, 70*s.*; Siberian, red, 57*s.* to 61*s.*; ditto, white, 62*s.* to 64*s.*: Pomeranian, Mecklenburg, and Uckermark, red, 61*s.* to 63*s.*; Ghirka, 55*s.* to 60*s.*; Russian, hard, 52*s.* to 56*s.*; Saxonska, 60*s.* to 63*s.*: Danish and Holstein, red, 61*s.* to 63*s.*; American, 55*s.* to 59*s.*; Chilian, white, 63*s.*: Californian, 65*s.*; Australian, 65*s.* to 66*s.*

In Liverpool American white wheat per cental was quoted at 12*s.* 6*d.* to 12*s.* 9*d.*; red winter and southern, 13*s.* to 13*s.* 6*d.*: No. 1 spring, 12*s.* to 12*s.* 2*d.*; spring No. 2, 11*s.* 6*d.* to 11*s.* 9*d.*; Canadian, white, 13*s.* to 13*s.* 4*d.*; ditto, red, 12*s.* to 12*s.* 6*d.*; California, white, 12*s.* 8*d.* to 13*s.* 2*d.*; Chilian, white, 12*s.* 4*d.* to 12*s.* 6*d.*; Australian, white, 13*s.* 4*d.* to 13*s.* 6*d.*; Spanish, white, 12*s.* 10*d.* to 13*s.* 4*d.*: Danubian, 7*s.* to 9*s.*; Ghirka, 11*s.* 6*d.* to 12*s.* 2*d.*; Egyptian, Saida, 10*s.* 4*d.* to 10*s.* 8*d.*; Behera, 10*s.* 3*d.* to 10*s.* 4*d.*; Buhi, 12*s.* 3*d.* to 12*s.* 6*d.*

The Paris wheat trade was very firm, with a rise of 1*s.* to 1*s.* 6*d.* per quarter. Mayence white brought 73*s.* per quarter; center, 67*s.* 6*d.*; Blanquillo, of Valledolid and Arevalo, were quoted at 72*s.*; Californian, at Havre, at 70*s.* 9*d.*; American, winter at 66*s.*; ditto, spring, 65*s.*

FLOUR.—The last week in October opened upon good supplies of country flour in the London market, with fair arrivals in bond from the United States, which were met by a more active demand. This large importation did not lower the rates, as all fine qualities, both English and foreign, maintained their tone. The Paris flour trade was also firm, with an upward tendency. The range of prices for consumption was 52*s.* 8*d.* to 56*s.* per 280 pounds. In Mark Lane the best town households commanded 50*s.* to 57*s.* per 280 pounds; best country households, 45*s.* to 57*s.*; Norfolk and Suffolk, 39*s.* to 44*s.* American brought 28*s.* to 30*s.* per barrel; extras, 30*s.* to 32*s.* In Liverpool English and Irish superfines were quoted at 44*s.* to 45*s.* 6*d.* per 280 pounds; extra ditto, 45*s.* 6*d.* to 50*s.*; French superfine, 50*s.* to 57*s.*; Spanish, 49*s.* to 50*s.*; Trieste and Hungarian, 66*s.* to 75*s.* 6*d.*; Chilian and Californian, 46*s.* to 52*s.*; American, per barrel, Western State, 30*s.* to 32*s.*; extra ditto, 32*s.* to 34*s.* 6*d.*; Baltimore and Philadelphia, 30*s.* to 35*s.*; Canadian, 31*s.* to 36*s.*

MAIZE.—In London American white maize was quoted at 31*s.* to 35*s.* per quarter; ditto, yellow, 31*s.* to 34*s.* In Liverpool American white brought 34*s.* to 34*s.* 6*d.* per 480 pounds; ditto, yellow, 33*s.* to 33*s.* 6*d.*; Danubian, 31*s.* to 32*s.* 6*d.*; Galatz, 34*s.* to 34*s.* 6*d.* The amount of maize entered for home consumption in the United Kingdom for the week closing October 31 was 47,324 cwts.

WOOL.—The English wool market was quiet but firm, prices being well supported. Southdown hoggets, 1*s.* 3*d.* to 1*s.* 8½*d.* per pound; half-breed ditto, 1*s.* 9*d.* to 1*s.* 9½*d.*; Kent fleeces, 1*s.* 8*d.* to 1*s.* 9*d.*; Southdown ewes and wethers, 1*s.* 4½*d.* to 1*s.* 5*d.*; Leicester ditto, 1*s.* 8*d.* to 1*s.* 9½*d.*

LIVE-STOCK.—In London live-stock quotations for the last week in October were as follows: *Cattle*, coarse and inferior, per 8 pounds, (to sink the offal,) 4*s.* 4*d.* to 4*s.* 10*d.*; second quality, 5*s.* to 5*s.* 4*d.*; prime large oxen, 5*s.* 10*d.* to 6*s.*; prime Scots, short-horns, &c., 6*s.* 2*d.* to 6*s.* 4*d.* *Sheep*, coarse and inferior, 4*s.* 4*d.* to 4*s.* 10*d.*; second quality, 5*s.* 4*d.* to 5*s.* 10*d.*; prime course-wooled, 6*s.* 4*d.* to 6*s.* 6*d.*; prime Southdown, 6*s.* 8*d.* to 6*s.* 10*d.* *Calves*, large and coarse, 4*s.* 2*d.* to 4*s.* 6*d.*; prime small, 5*s.* to 5*s.* 4*d.* *Hogs*, large, 4*s.* 6*d.* to 4*s.* 10*d.*; small porkers, 5*s.* to 5*s.* 4*d.* A full supply of animals is noted, but indifferent qualities as well as bad weather had restricted sales.

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